Volume XVIII.
Number 4.

APRIL, 1900.

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APR

TEXTILE WORLD.

and Industrial Record.

Special Cotton Number.

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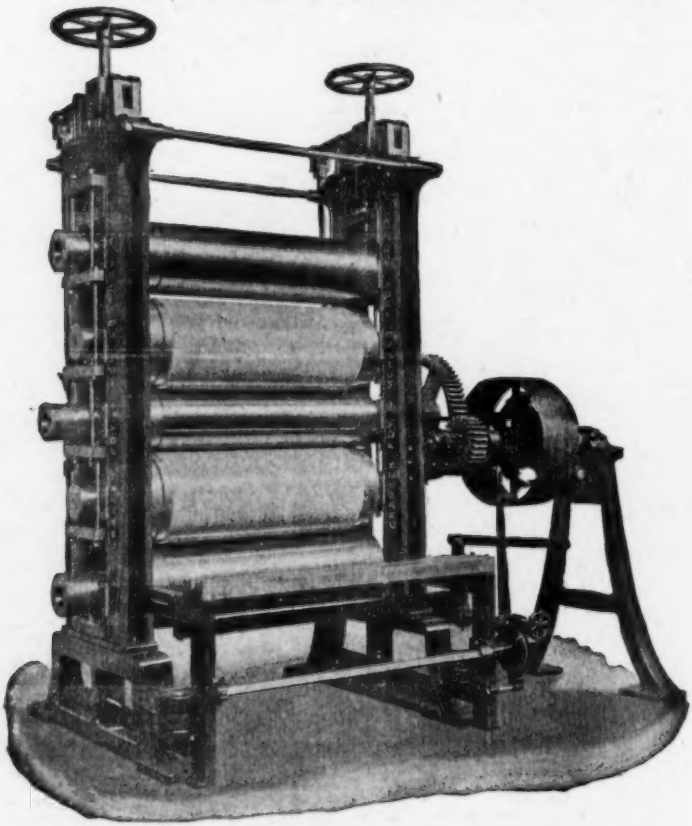
GUILD & LORD.
PUBLISHERS.

620 ATLANTIC AVENUE.
BOSTON, MASS.

Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDARS, MANGLES AND ROLLS.

TENTERING MACHINES,
MERCERIZING MACHINES.

Granger Foundry and Machine Co.

PROVIDENCE, R. I.

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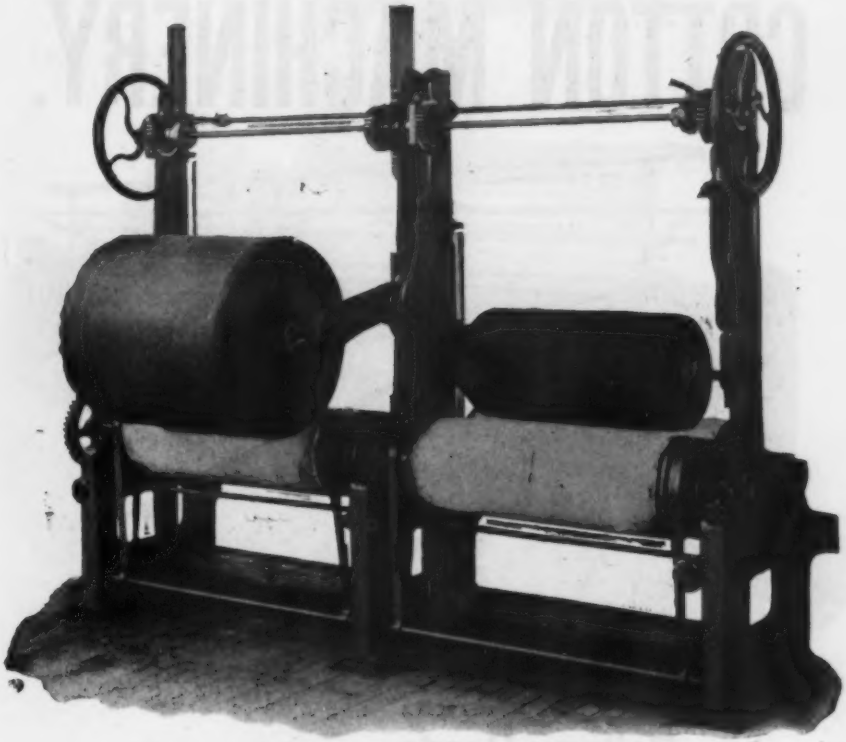
BLEACHING, PRINTING, DYEING AND FINISHING

MACHINERY,

For Textile Fabrics



PATENT WINDING MACHINE.

W. P. SIMPSON, Patentee.

FOR USE IN CONNECTION WITH

Singeing Machines, Soaping Machines, Drying Machines, Etc.

No stoppage or even "Slacking up" of the machine is necessary.

Cutting is done close to the seam, thus eliminating waste.

As creased ends are avoided at beginning and end of roll, no refinishing is necessary.

One man can attend two or more Winders, as the new roll is started automatically, and completed roll can be removed at convenience.

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PHILADELPHIA, PA.

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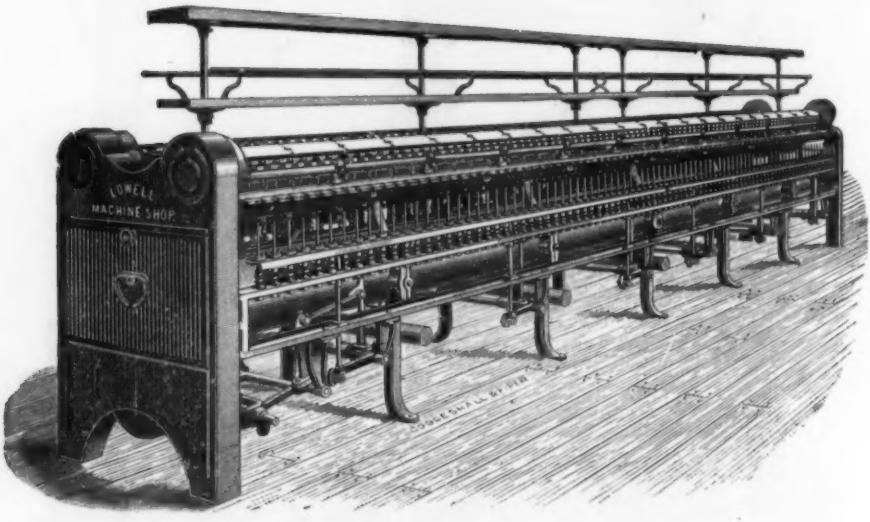
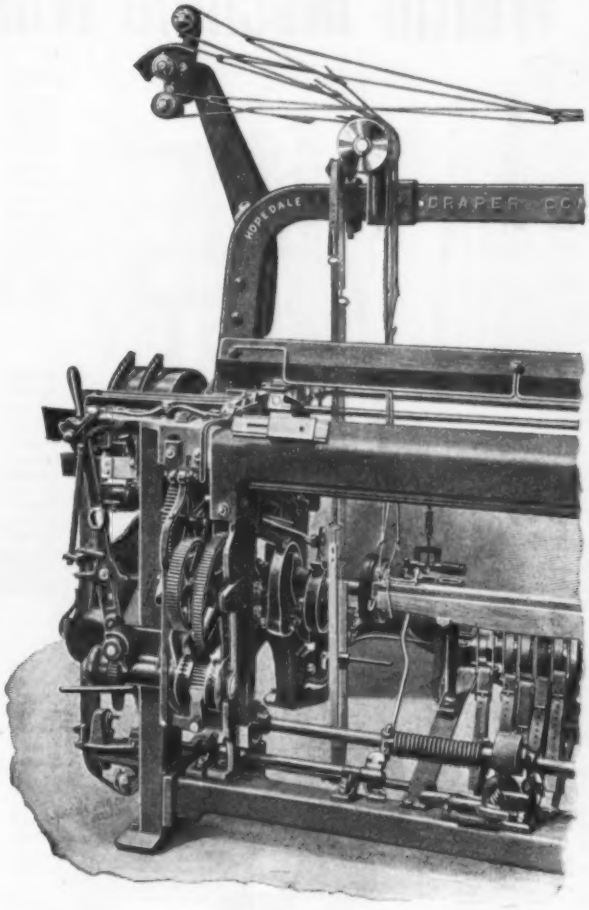
Lowell, Mass.,

COTTON MACHINERY.



Revolving Flat Cards,
Railway Heads,
Drawing Frames,
Roving Frames,
Ring Spinning Frames,
Twisters, Spoolers,
Warpers, Slashers,
Looms.

WORSTED MACHINERY.



A Few Details

Of one of our recent constructions in

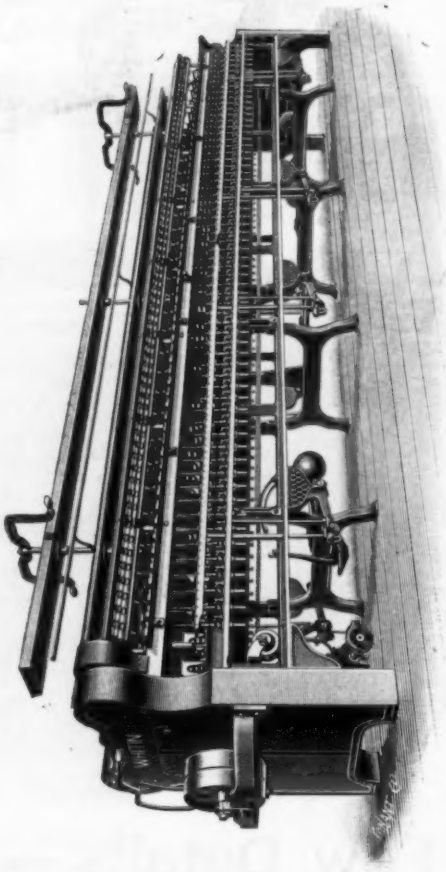
NORTHROP LOOMS.

WE INVITE CORRESPONDENCE.

THE DRAPER COMPANY, Hopedale Mass.

The Whitin Machine Works,

Revolving Flat Carding Engines, Railway Heads,
Long Chain Quilling Machines, Drawing Frames,
Wet and Dry Twisters, Reels,
Looms, Spoolers.



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BUILDERS OF

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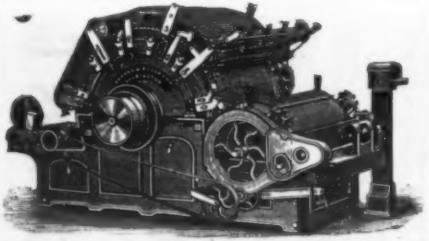
Southern Office: 38 So. Tryon St., Charlotte, N. C.
S. W. CRAMER, Southern Agent.



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LIMITED,

PAWTUCKET, - R. I.

Revolving Flat Cards.

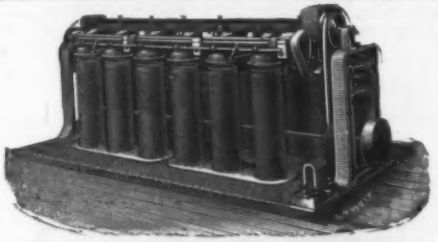
The Simplest and Most Accurate. Greatest Production. Best Quality. Least Waste.

OVER 16000 WORKING.

Electric Stop-Motion Drawing.

The quality of the sliver produced cannot be surpassed. Waste, "single" and roller laps are prevented, production increased, and great saving effected.

OVER 56,000 IN OPERATION.



Bale Breakers, Feeders,

Combined Self-Feeding Openers,

Breaker and Finisher Lappers,

All made from entirely new patterns and containing many valuable patented improvements.

Slubbing, Intermediate, and Roving Machines.

New patented Differential motion, New Arrangement of Cone Drums, New System of Balancing top or bobbin rail, etc.

SPINNING FRAMES, CONE WINDERS,
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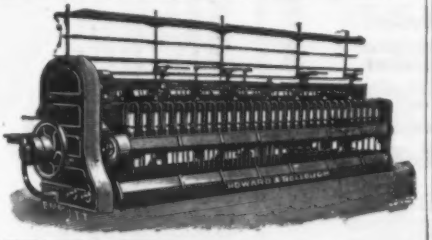
All parts of above machines are made by special tools and are exact duplicates.

We Invite Investigation and Comparison.



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for WOOL, SHODDY, and COTTON, is

Second to None

on the market. It holds more stock, requires less space, and needs no "attachments."

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Spinners of Worsted Yarns. Mixes and Fast Colors Specialties.
Boston Office, 570 Atlantic Avenue.

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Messrs. Woonsocket Machine and Press Co., City,

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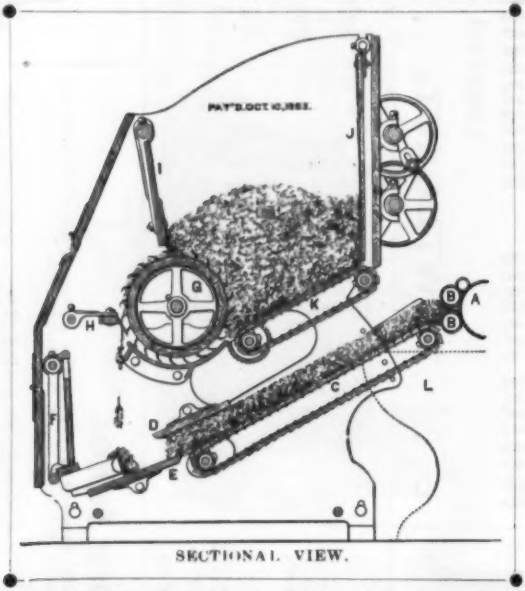
WOONSOCKET WORSTED MILLS,
EDWIN FARNELL, Agent.



SECTIONAL VIEW.

THE FISHER CARD FEED is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty. It is built in all sizes and guaranteed as represented.

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Worsted Yarns.
C. T. Crocker, Pres. C. B. Smith, Treas.

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Woonsocket Machine and Press Co.,

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Yours respectfully,
STAR WORSTED COMPANY,
(Second order.) A. GARTH, Supt.

MANUFACTURED BY

Woonsocket Machine and Press Co.,

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TAUNTON, MASS.

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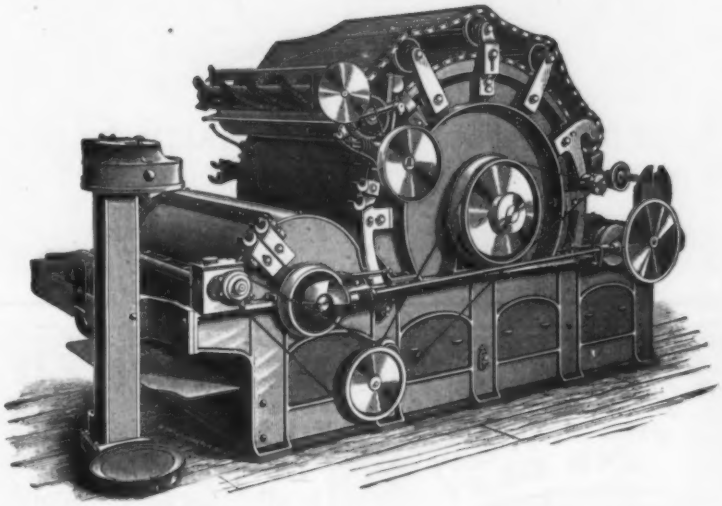

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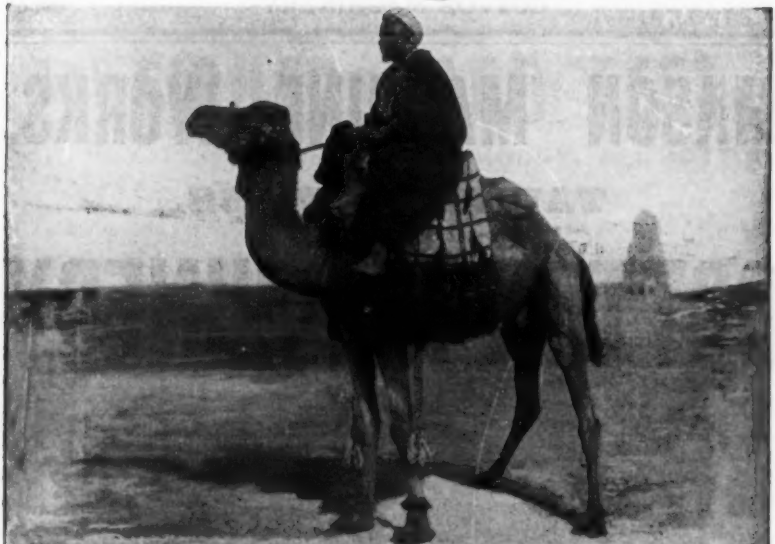

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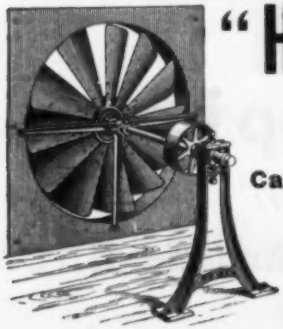
THE LATEST AND BEST.
LOOMS, DOBBIES, HARNESS MOTIONS
BEAMING SPOOLING WINDING DYEING AND SIZING MACHINERY
POWER TRANSMITTING MACHINERY.
FREIGHT ELEVATORS, PATENT FRICTION CLUTCHES.



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DRYING AND VENTILATING.
Carbonizers, Yarn Scouring Machines.
"HURRICANE" DRYERS
For Wool, Cotton, Hair, Yarn, Stockings, Underwear, etc.
Plans, Estimates and Catalogues upon application.
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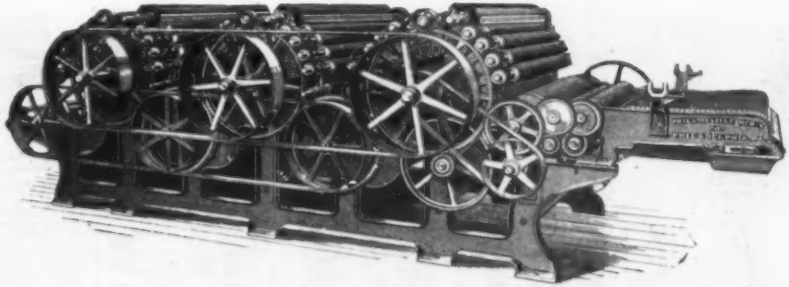

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For Hosiery, Underwear, Yarn, Cotton Stock and Wool.

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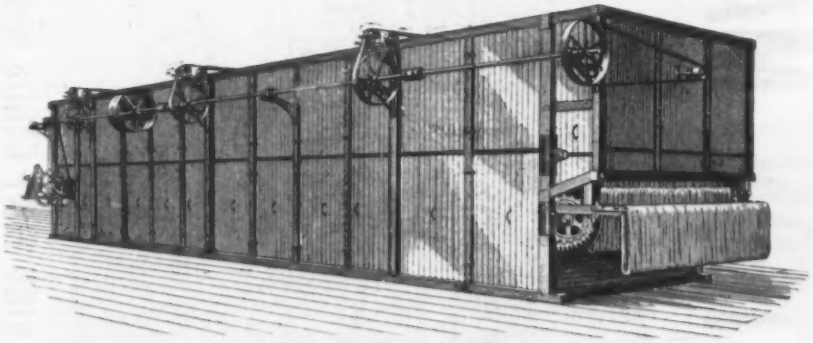

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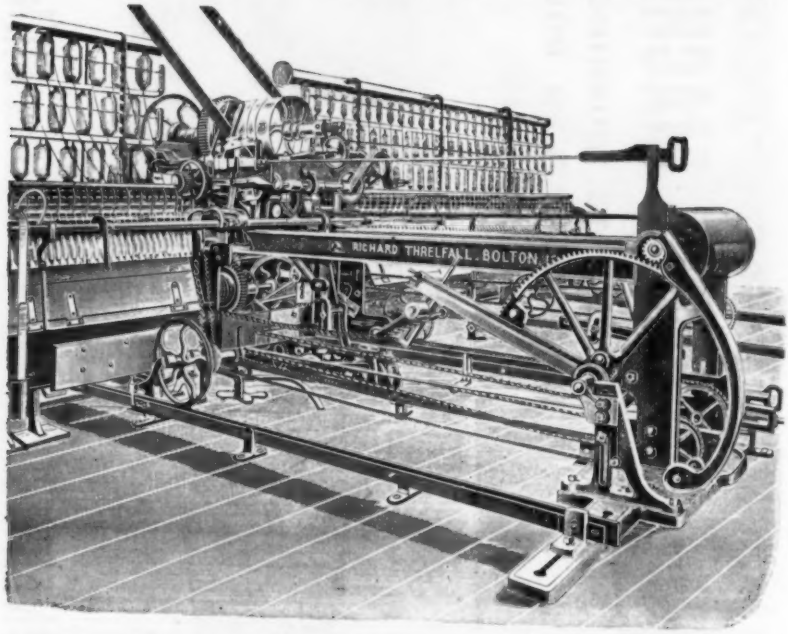
COTTON MACHINERY



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DRAWING FRAMES
With Electric Stop Motion.

SELF ACTING MULES
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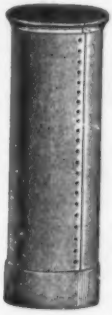

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We are now building our **New High Speed Loom** with the **Northrop** continuous filling and warp-stop motions attached.

We Build Looms for Weaving all Grades of Goods.

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Sews any fabric, wet or dry, thin or thick, ne stitch or coarse stitch.
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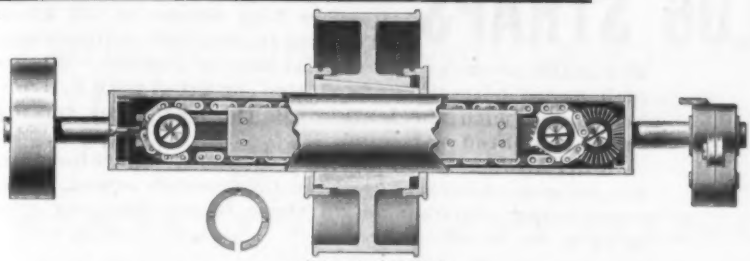

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THE ROY TRAVERSE GRINDER with our Differential Motion and new Adjustable Grinding Wheel. Made for Emery Filleting when desired.

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WIRE HEDDLES

PATENT

of every description used in

COTTON AND WOOLEN MILLS.

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Superior Harness Frames—Iron End Frames a Specialty.

Special attention is called to our Heddles and Harness Frames as being perfectly adapted to weaving the finest fancy cotton goods. We are also *AGENTS and IMPORTERS of the German Tinned Cast Steel Wire Heddles.*

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LOOMS of all descriptions, etc

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CLEANS WOOL, FLOORS ANYTHING.

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WE MAKE Duck, Ticking and Leather Lug Straps of all kinds. We carry in stock all ordinary sizes and make to order any special size or pattern. We furnish straps with the ends slotted, or fitted with 1, 2, or 3 holes, and with the leather (in the duck and ticking) either cemented or riveted.

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WE MAKE Tape Picker Loops in all sizes, and carry in stock loops from 1 5-8 inches to 2 inches long. We make them either 6 or 7 ply. Our loops are as good as the best material and the most careful workmanship can make them.

Our deliveries are prompt and our prices reasonable.

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The Stirrup is always in place.

No bent stirrup resting on rolls.

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Card Clothing of Every Description

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Good Second-hand Belting and Card Clothing Always on Hand.

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BUCK CARD CLOTHING HAND CARDS.

WE SOLICIT YOUR ORDERS.

QUALITY GUARANTEED.

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LOOKE'S MILLS, ME.

Thread and Silk **SPOOLS** of any description.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted

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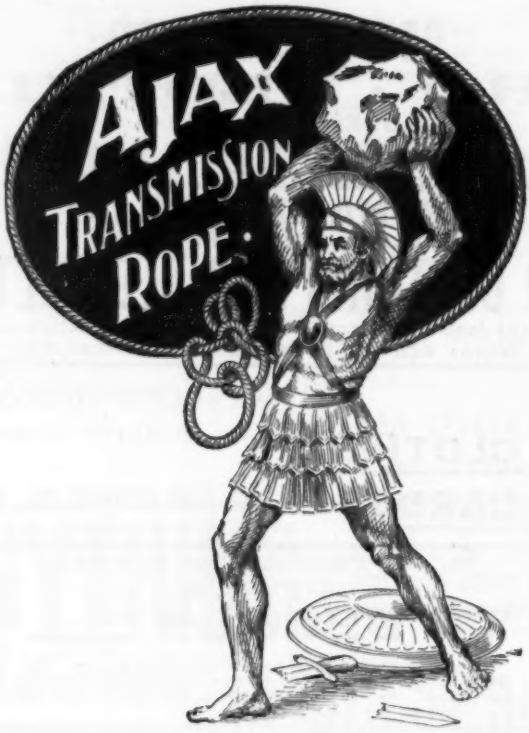
The Standard of all Transmission Ropes.

Has been Tested by the Largest Users in the Country.



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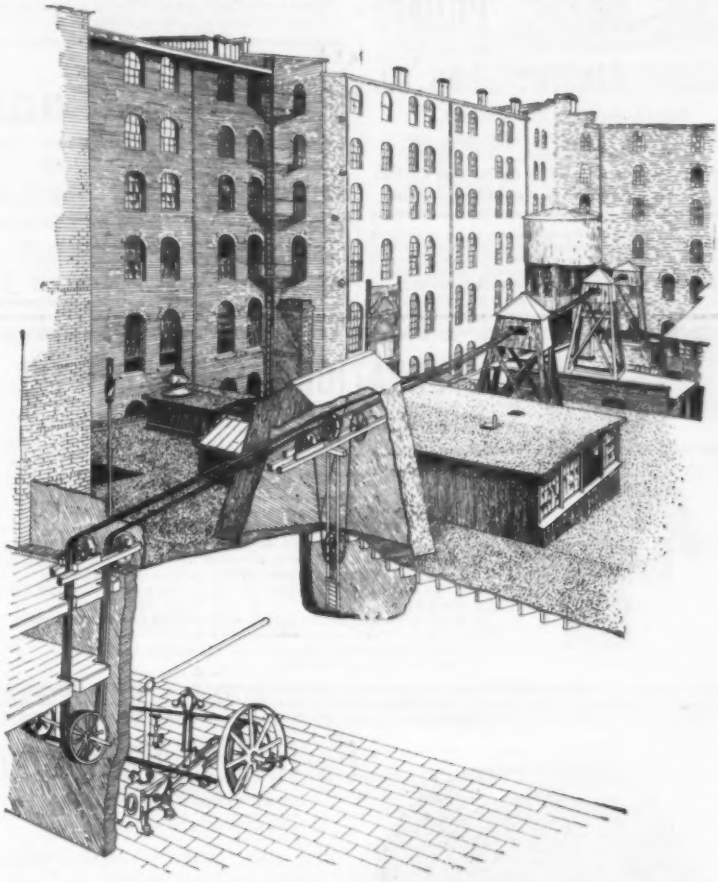

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FOR

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MACHINERY.

Roving Spindles and Flyers a Specialty.
Light Forgings. Repairing of all kinds.

ELEVATORS, Hoists, Waiters for any place, capacity or weight, Electric, Steam, Hydraulic or Manual Motors, Shafting, Pumps, Boilers, Pipe, Rope, Drug and Paint Mills, Presses, Gearing, Mining and Coining Machinery, Street and Road Making and Sweeping Machinery.

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Fallers and Gills,

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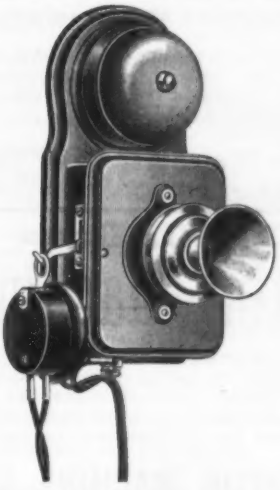

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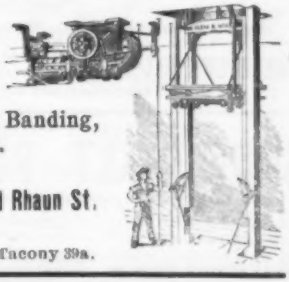

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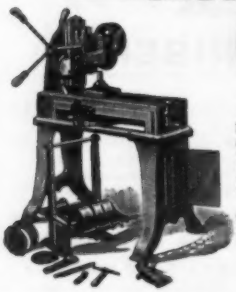

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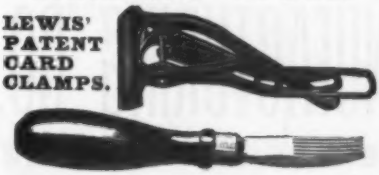

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Bobbin-Holder. 645,417. Geo. A. Clark, Lowell, Mass., assignor to the Draper Co., Portland, Me., and Hopedale, Mass.

Baling-Press, Cotton. 646,220. Edmund M. Ivens, New Orleans, La.

Baling-Press, Roller. 646,345. Edmond F. Bates, Lloyd, Tex.

Cotton-Compress, Roller. 646,158. Louis Raborn, Whitney, Tex.

Cotton-Feeders, Valve-Gear for Pneumatic. 646,248. Geo. W. Williams, Waco, Tex., assignor to the Kellett-Chatham Machinery Co., same place.

Cotton-Gins, Flue System for. 646,367. Theophilus C. Eberhardt, Prattville, Ala.

Cards, Machine for Punching Jacquard. 644,871. Vernon Royle, Paterson, N. J.

Cotton-Openers, Dust Trunk or Tube for. 644,975. Walter Frost, Manchester, Eng., assignor to Samuel Herbert Brooks and Frederick George Goodbehere, same place.

Cotton-Cultivator. 644,812. Chas. A. Thurmond, Perry, Ga.

Combing-Machine. 645,410. Alfred Wenning and Chas. H. Gegauff, Mulhouse, Ger., assignors to the Societe Alsacienne de Constructions Mecaniques, same place.

Cotton, Apparatus for Unbaling and Blending Raw. 645,167. Samuel Ecroyd, Chorltoncum-Hardy, and Edward E. Marsden, Didsbury, England.

Cotton-Gin, Roller. 645,288. James E. Cheesman, New York City, assignor to the Cheesman Cotton Gin Company, same place.

Cotton Piece-Goods, Process of Fixing the Finish on. 645,237. Milton S. Sharp, Heckmondwike, England.

Cloth-Clamp for Textile Machinery. 644,543. Robert P. Winsor, Auburn, R. I., assignor to the Winsor & Jerauld Manufacturing Co., Saco, Me.

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Cotton-Picking Machine. 644,544. William L. Belt, Washington, D. C., assignor of one-fourth to William Wallace Kirby, same place.

Cotton-Elevator and Gin-Feeder. 644,532. Stephen D. Murray, Dallas, Texas.

Cotton-Gin. 644,155. Abner D. Thomas, Little Rock, Ark.

Cotton-Gins, Safety Attachment for. 644,156. Abner D. Thomas, Little Rock, Ark.

Carding-Engines, Apparatus for Stripping Flats in. 645,832. Wright Rhodes, Manchester, England.

Cotton or Other Fibrous Materials, Apparatus for Compressing. 645,728. Geo. A. Lowry, Chicago, Ill., assignor to the Planters Compress Company, of West Virginia.

Cotton-Picker. 645,782. Ludwik Bilan, Lexington, Oklahoma.

Drying Fabrics, Device for. 644,305. Lucinda E. H. Sherwood, Chicago, Ill.

Dyeing Fabrics, Process of. 646,379. Giovanni Tagliani, Milan, Italy.

Dyeing, Apparatus for. 644,988, 644,989, 644,990. James Major, Eccles, England.

Frame, Embroidery. 644,597. Chas. G. Guyer and George K. Rudert, Wilmington, Del.

Fabrics, Composition for Treating Textile. 644,670. Charles Green, Uxbridge, Mass., assignor to Albert C. Warren, Newton, and Geo. L. Stevens, Boston, Mass.

Fabrics, Method of Producing Ornamental. 644,904. Mark H. Frank, New York City.

(Continued on page 717.)

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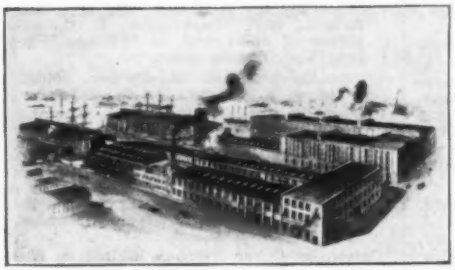

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TEXTILE WORLD.

Vol. XVIII. APRIL, 1900. No. 4.

ALBERT TILT.

The subject of this article is the president of the Silk Association of America, and prominently engaged in the silk manufacturing industry of the United States as president and treasurer of the Phoenix Silk Manufacturing Company, Paterson, N. J., and of the Adelaide Silk Mill, Allentown, and the Tilt Silk Mill, Pottsville, Penn., all large establishments.

Mr. Tilt was born in Boston, in 1841, removing to New York with his parents in 1850. He is a man of liberal education. His father, Benjamin B. Tilt, came to the United States from Coventry, England, in his early youth, bringing with him an excellent practical knowledge of silk manufacturing, which he turned to profitable account soon after his arrival in this country, by entering into partnership with a Mr. Dowell, of Boston, forming the firm of Tilt & Dowell, which commenced in an humble way, but soon developed a business of considerable proportions. After several years of prosperity, Mr. Dowell died, and the firm of B. B. Tilt & Company was formed, a new partner being admitted. In 1847, the title of the firm was changed to Tilt & Dexter, which established a sales department in New York City, in 1849, for the disposition of the products of the factory. In 1854, Mr. Dexter and others bought out Mr. Tilt's interest and organized the well-known house of Dexter, Lambert & Company, Mr. Tilt turning his exclusive attention to the silk commission business in New York, until early in 1860, when he removed to Paterson, N. J., and engaged in the manufacture of silk goods, taking into partnership, in 1862, his son Albert, under the firm name of B. B. Tilt & Son, who, in 1865, organized the Phoenix Manufacturing Company, which afterwards became known as the Phoenix Silk Manufacturing Company, which exists today as one of the largest silk manufacturing enterprises in the country. The elder Mr. Tilt, ably assisted by his son Albert, continued at the head of the concern until his death, September 30, 1879, at the age of seventy-two years. Mr. Albert Tilt succeeded his father as the president of the company and general director of its vast interests.

The steady expansion of business of the Phoenix Silk Manufacturing Company demanded additional facilities of manufacture, which led to the establishment of the silk mill at Allentown, Penn., which was dedicated November 17, 1881, as the first of the Pennsylvania line of silk mills, which now number nearly or quite one hundred, all of which have sprung up within the past eighteen years. The Allentown mill is probably the largest single silk mill in the country, its length being 800 feet and its height four stories. Several years later, when further facilities were required, the mill at Pottsville, Penn., was erected, and devoted exclusively to the throwing branch. The main structure of this mill is 400 feet in length and four stories high. Over 2500 hands are employed by Mr. Tilt at his several mills, and the volume of production in broad silks, ribbons, handkerchiefs, mufflers, etc., is enormous.

Mr. Tilt has always taken a prominent part in the exhibition of his silk products, as representative of the American industry in this line, at

every international exposition since the one at Philadelphia in 1876, where he also showed the only silk exhibit in operation of any importance. Mr. Tilt made a most creditable exhibit at the Paris Exposition of 1878, being awarded medals of silver and bronze. So impressed were the European manufacturers with his Paris exhibit, which was in operation for the production of goods, that much pressure was brought upon Mr. Tilt to sell his machinery, and, in consequence, he disposed of his book-mark loom to an Austrian, who paid much more than its original cost, and took it to Vienna, possibly as a pattern to build others after.

Mr. Tilt is highly esteemed for his social qualities, and for his tact and sagacity in business transactions. His eminent executive ability is recognized in his selection as president of the Silk Association of America. Mr. Tilt is a member of the Metropolitan, Riding, Republican, New York Athletic, and Army and Navy clubs, of New York.

The Cost of Maintenance for Seamless Hosiery Machines.

Editor Textile World.

The question as to cost of keeping up knitting machines in often asked, and having had occasion to look into it we submit the results as a matter of interest to the trade.

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In the very busy year from April 1, 1899, to April 1, 1900, they have got parts and repairs ranging in amount from 25 cents to $9.00 per month, the total for the year being $45.50 for everything in that line, not including needles. The average per machine was 91 cents for the year, 7 7-12 cents per month.

PAXTON & O'NEILL.

The Flemish in England.

In 1560 the Spanish embassador reported to Philip II. that there were more than 10,000 recent Flemish refugees in England, and two years later he gave the number as at least 30,000. In 1568 there were more than 5000 in London alone, and as many more in Norwich. The Cinque ports were full of Dutch and Walloon refugees; in 1566 they numbered in the town of Sandwich 120 householders, as against 291 English householders; that is, they were nearly one-third of the population. They introduced into Sandwich the manufacture of paper and silk. In Maidstone the next year such refugees established the linen thread industry. To Honiton and other Devonshire towns they brought the dainty art of lace-making. They began the steel and iron works of Sheffield, and the making of baizes and serges at Leeds. They revolutionized the art of glass-making in England, and raised market-gardening and horticulture to quite a new level. There is thus no doubt that to the very marked and rapid rise in the standard of domestic living, which characterized the age of Elizabeth, this influx of Netherlanders contributed in no small degree. It is part of Elizabeth's legitimate glory that during most of her long reign and through her own policy, profound internal peace was preserved in England throughout one of the stormiest periods of history. During the reign of Elizabeth probably more than 100,000 Dutchmen and Flemings became Englishmen. They were picked men, and it is safe to say that nearly all were Puritans. In point of blood every Netherlander was more than half English already; a slight change of speech was enough to complete the transformation.—Fiske.

—In 1844 we meet with the first tin-prepared ground, used in the printing and dyeing of many articles in wool and cotton.

RAILWAY CONSOLIDATION.

The proposed lease of the Boston & Albany Railroad to the New York Central & Hudson River Railroad Company is now before the Massachusetts legislature, for the purpose of obtaining the consent of the commonwealth to the contract and lease which have been made and entered into between the directors of these two railway corporations.

It is not our intention to discuss the merits of this particular lease, but the subject brings up the whole question of the ethics and economies associated with the consolidation of railway lines, especially those that unite the agricultural and commercial centres of the country.

So far as the city of Boston is concerned, as a great commercial port, for export trade, there does not seem to be any doubt that the proposed union of these two systems will prove of immense advantage. The geographical position of Boston, with its capable harbor, makes this place one of the most important in the United States for any trade that may be had with European countries. If proper transportation facilities are had with the West, there is no apparent reason why this city should not lead, or at least compare most favorably with others in importance as a shipping point. All of the great shipping points on the Atlantic and the Gulf are reaching out for opportunities such as are now offered to Boston. Such places as Galveston, New Orleans, Newport News, Baltimore and Philadelphia are making strenuous efforts to obtain what is now within the grasp of the metropolis of New England; and if it is not availed of at once the chances are that much of the trade that naturally belongs to this port will go to others, even to those in Canada, such as Montreal. New York seems to have all that it can handle at the present time, the water front of whose harbor is already congested and overtaxed, which makes necessary such a port as Boston for taking care of much of the immense amount of merchandise that is moving towards the East for export. There is no necessity for any feeling of jealousy on the part of New York towards Boston for any trade that the latter may receive, as it has more than it can take care of, as it is.

One of the most attractive arguments that have been made before the railroad committee of the Massachusetts legislature, is the statistical one that was recently presented by Edward Atkinson, exhibiting facts pertinent to certain economic phases of the question. Anything that will contribute to the lowering of the rates of freight is of the utmost importance to the commercial welfare of this country, and it has been demonstrated in more than one instance that the only means by which this can be accomplished, is the union of the great arterial railway systems that stretch from the East to the West. All merchandise for export is obliged to compete with other of like kind in this country, as well as that from other countries in the world. As Mr. Atkinson has pointedly said: "The major factor in controlling rates is the competition of product with product in the great markets of the world. Orders will be turned from London by the touch of the button in the wall away from one part of the world to another, on an advance of a cent a bushel on grain, or one-quarter of a cent a ton on meat." Therefore, in order to hold our export trade for the products of our Western states and territories, the freight rates must be low enough to enable them to compete with similar products raised or deposited near the point of consumption. Authentic statistics are available, showing a constant decrease in the rate of freight per ton per mile. This rate was over 62 per cent. higher in 1882 than it is today; and within this period, the average tons moved per capita of population of the country had increased 80 per cent. Not-

withstanding the increase within the last seventeen years has been nearly 63 per cent. in railway mileage, the number of miles of railway per capita has been almost constant; that is to say, the number of miles per one thousand inhabitants in 1882 was 2.18, while in 1898 it was 2.51, showing a small increase only. While the mileage has increased since 1882, as stated above, 63 per cent., the increase in the amount of freight moved has been 153 per cent., showing the immense amount of business that the railway systems of the country are doing, and the reason why they are able to reduce freight rates. According to the experiences of trade conditions and wants within the last twenty years, it would appear that at least 2.5 miles of railway are necessary per one thousand inhabitants, to properly transport merchandise that enters into the commerce of the country, and to meet ordinary passenger traffic.

The question of a proper relation between the rights of railway corporations and their regulation by national and state laws, is a complex one; in some respects more so in the United States than in other countries, due to the peculiar circumstances surrounding the organizations and purposes of our railways, differing from those existing in European countries, where they have been built with a leading purpose of meeting military necessities. Legislation and administration on the part of the government, whether it be national or state, should not be of such a character as will operate adversely to the rights of stockholders, the public, or to society in general. Laws should be framed for the purpose of assisting railways in the performance of their functions, and foster, rather than oppose, proper co-operation in the management and attainment of all economic ends for which railways are constructed. Co-operation can be secured without affecting in the least such form of competition as will be beneficial to the owners of railways and their patrons.

Regulation by legislative enactments is most difficult of accomplishment in this country, on account of the different economic conditions that prevail in different sections, and because of the diverse developments of the various systems that exist both in the Northern and Southern sections. Efforts have been made for the last twenty-five years on the part of states to regulate in some form, railway traffic, and for the last ten years the federal government has been active in this same direction, all of which has revealed the great difficulties to be surmounted, and which have not yet been overcome. An important feature in all legislation is the elimination of any tendency that will check the normal development of our railway systems, which are oftentimes endangered by a hostile attitude on the part of a certain class of legislators towards corporate property and functions, without any fair minded consideration to the industries and social needs to be served. This sentiment of opposition, due more largely to ignorance and misinformation, than to anything else, is something that should be seriously guarded against.

NATIONAL ASSOCIATION OF MANUFACTURERS.

Considering that this association, representing in the neighborhood of eleven thousand individuals and firms, actively interested in manufacturing enterprises, is to hold its fifth annual convention in Boston the latter part of this month, is our excuse for devoting considerable space to its objects and its relations to the manufacturing community. It may be well to say, in order to satisfy a number of inquiries, that this association declares itself as non-political, non-partisan, and non-sectional; and while it is making strong efforts to extend the export trade of the country, it is none the less an advocate of an equitable protective tariff, for holding to our manufacturing industries the home market.

The association has declared in its constitution its belief in the principle of reciprocity in our tariff legislation. Among its tenets are, a belief that ships sailing under the flag of the United States should carry our entire maritime commerce; that there should be formulated a judicious system of subsidies, in order to complete restoration and extension of our merchant marine; a scheme for the building of the Nicaraguan canal by the federal government, as essential to the commerce of the United States; and means for the improvement and extension by the federal government of our natural and artificial water-ways to the full needs of commerce, connecting the Great Lakes with the rivers of the Mississippi Valley and Atlantic seaboard.

The association has asserted itself, at its several conventions, by resolution and by the utterances of its officials, in favor of a protective tariff "as an economic policy," in the language of Thomas Dolan, its first president, "under which the manufacturing industries have had such astonishing development," requiring no further argument for its defence. Mr. Dolan's views were strongly endorsed when he asserted that "our own market is the best in the world, it is the only market of which we may have absolute control, and the most ordinary considerations of business prudence should induce us to hold it fast, not surrendering any portion of it to foreigners, in the vague hope that we may compensate ourselves for the losses of such folly by gaining entrance to the markets of the world, of which we hear so much and know so little." What Mr. Dolan has here said has been reiterated by his successor, the present president, T. C. Search, that "there are no objects that appeal to the American people with more force than a tariff for protection to American industries,—needing no herald to sound its praises at this time. The unprejudiced mind must undoubtedly see that our years of prosperity have been identical with high tariff. Let us try to keep the wages of the laboring people at such a point that we can sell what we make." While giving these official utterances, it should be remembered that this association declares itself as standing in no other light than a business organization, with a membership embracing manufacturers of widely differing political views. In order to make this clear, president Search, at the second annual convention of this association, in his opening address, said that "the relation of the tariff to the industries of the country is purely a business matter, and that it should ever be tinged with politics is a great misfortune to the manufacturing interests of the nation, and it is a matter of the utmost importance that the tariff should be taken out of politics and considered purely upon a strictly business basis." In order to make these views those of the association, there was passed at that convention a resolution that the tariff duties "should be such as will be consistent with adequate protection of our manufacturing and agricultural industries, and the labor they employ, and that it should contain no specific duties or mixed ad valorem and specific duties." Adequate protection alone is asked for.

The question of tariff reciprocity with other nations came before the first convention of the association, and has been the subject of earnest discussion in its subsequent conventions, upon the basis that was suggested in the 1890 tariff, and which has again been carried out in the law of 1897. The association is on record as favoring the extension of this system, "which may be employed to secure for us tariff favors in Latin-American and other markets, in which we are the largest buyers." As Mr. Search said in his annual report before the third annual convention, "This is a consideration of much importance to us in the development of our foreign commerce, as the tariff

rates of each country to which we export our goods have a practical bearing upon our trade, and we cannot expect to get conditions which will prove of worth to us, unless we are willing to give something in return."

Perhaps the most important efforts of the association have been those directed to the establishment of commercial warehouses in foreign countries. Certainly nothing has created such a widespread interest in the organization, both at home and abroad, as the schemes that have been devised in this respect, for the purpose of carrying out a systematic plan of warehouses in Latin-America. A commission of American manufacturers was sent to South America in 1896 to investigate the trade conditions there, especially in Brazil and the River Plate countries. In pursuance of a policy in this direction, a small warehouse was established in Venezuela, for the display and sale of American manufactured products. A formal opening of this warehouse in Caracas took place in the early part of 1898, and it was looked upon at that time as an enterprise of the greatest importance in the history of Venezuela. Privileges of a like character are expected to be obtained in other trading centres in South America; and the establishment of a similar warehouse in London, England, has been contemplated, as the great trade centre of the world, where merchants from every quarter of the globe congregate and consummate their purchases. Like schemes are had in mind for such places as Hamburg, Amsterdam, Antwerp, Copenhagen, and Berlin, as distributing centres for a large and profitable European trade. Agents of the association have made exhaustive investigations in Japan and China with the same object in view.

Another matter that the association is earnestly taking hold of is the establishment of a parcels-post by the United States. This was taken up at the second annual convention of the association, with a view of extending foreign mail facilities, so as to include merchandise that is sent as fourth class matter. With such a system in operation, it is believed that it would enable one to send abroad easily, cheaply and promptly, small parcels of goods, which are now sent by foreign express companies, with considerable trouble, at high rates, and often with exasperating delays. Attention has been frequently called to the fact that nearly every European country, with most of the world, except the United States, has a parcels-post arrangement in operation, while we have, in a measure, this system in use with only a few surrounding countries like Mexico, parts of Central America, some of the West Indian Islands, etc. We have nothing of the kind with any country of Europe, though there have been applications on file in our Post Office Department for several years, for such postal facilities as exist in Great Britain, Germany, etc. The result is, in the opinion of the association, that we are, to this extent, at a disadvantage in taking international business in competition with foreign manufactures. In the language of President Search, "Our present parcels-post system is of comparatively small value, and the limited extent to which it is used affords no basis upon which to judge of the volume of foreign trade which could be developed with proper facilities of this character." It is doubtful if the postal authorities of the United States are disposed to undertake the extension of this system, unless it be at the instigation of the business interests of the country, and what is needed is a well defined and strongly supported demand from such an organization as the National Association of Manufacturers.

The parcels-post system was the subject of a lengthy communication in one of the recent issues of the Boston Transcript, from an evidently well informed writer, showing the advan-

tages of this liberal use of the postal facilities in Switzerland and other countries in Europe, both as a post office revenue measure and a saving to the people. According to this writer, within the combined area of Germany and Austria, parcels up to eleven pounds in weight go anywhere within a distance of forty-six miles, for six cents, and for a greater distance for twelve cents. He says that farmers and small tradesmen use the post most freely, and that it is not uncommon in Berlin for 10,000 parcels to go out daily in the morning delivery, and 5000 at each of the other deliveries, noon and evening. The Swiss post carries parcels up to any weight, but on large parcels the rates increase according to distance; and, notwithstanding all of this wonderfully cheap service, it is said that it was accompanied by an actual profit of over $200,000 in the year of 1898.

It has been said in opposition to any system of this kind, for domestic purposes, that it would injure, if not destroy, the business of storekeepers in small towns, as the merchants of the larger towns would take advantage of sending merchandise to their customers at a very small cost through the mails. While this might be applied to such postal facilities, it should be borne in mind that practically the same thing is already being carried out in the neighborhood of large cities by express companies, which enter into some arrangement for a free delivery of merchandise sold by the large mercantile houses to their customers in the suburban towns, to the acknowledged injury of the small merchants in the outlying districts. While it may be an admitted fact that some merchants are thus injuriously affected, to some extent, it is equally evident that the consumer is materially benefited. In some respects, it places the government in the same position as the express companies, all of which is done at some profit.

—The fat mordants are mainly used in the form of Turkey red oil or soap.

THE SILK INDUSTRY.

The annual reports of the secretary and committees of the Silk Association of America furnish some interesting data, lucidly showing the condition of the silk industry in this country for the past twelve or more months. It appears that the silk mills of the United States are equipped with machinery of high efficiency, and in excellent condition, to which there is continual improvement and additions. While this appears as an accepted fact, as an instrument for successfully meeting foreign competition, its dangers are of a nature as likely to increase manufacturing facilities so that the production will exceed the demands of consumption, and force a domestic competition to a limit where there will be little or no profit. The silk industry of the United States consumes one-third of the world's production of raw silk, say ten to twelve million pounds annually, which, it is estimated, at the present average range of prices, will cost manufacturers at least $46,000,000 for the current year.

The number of pounds of raw silk imported in 1899, amounted, according to the secretary's report, to 11,163,317 pounds, at an invoice value of $42,399,604. These figures differ from those of the United States custom houses, but immaterially so. This shows an average invoice value of $3.85 per pound, which is about the average value of imports of Japanese filature No. 1. Nearly one-half of the imports of 1899 consisted of that country's growth of silk. The highest grade of silk, of which $2,500,000 were imported, consisted of classical Italian, at an average invoice value of $4.50 a pound. The lowest grade of silk, at an average invoice value of $3 per pound, came from Shanghai steam filatures and double extra Canton. These statistics are taken from the United States Treasury Reports, and are about fourteen per cent. under the average price of the best grades of raw silk in the New York market, as given by Secretary Allen.

The last twelve months has wit-

nessed one of the most remarkable advances in both the raw and manufactured product of recent years. This is exhibited in one of the reports made to the Silk Association, showing an advance of from forty to fifty per cent. in the raw, though manufactured goods in the same period did not advance over twenty-five per cent. For instance, classical Italian silk was quoted in January, 1899, at $3.95 to $4.15 per pound, and in December of the same year, at $5.40 to $5.50 per pound, and the Japanese best No. 1 filature advanced in this period from $3.67 to $5.75.

Comment is made upon the relatively poor condition in which silk is reeled in China. If this growth of silk were better and more evenly reeled than it is now, it is thought that it would result to a greater profit, both to the seller and the buyer. Some means should be devised by which an improvement in this respect can be accomplished. There is a possibility of the cultivation of silk in newer countries, for the relief of manufacturers, in furnishing them with a larger supply, as colonies of sericulturists have emigrated to such countries as Brazil and Australia, who will undoubtedly take up this occupation, with which they are so familiar and well qualified.

Silk is finding its way into new channels of business, and there is an increased consumption noted in the manufacture of ladies' linings, neckties, upholstery, and other like fabrics. The employment of silk in the manufacture of broad goods for women's wear, as for shirt waists, may be a matter entitled to more than passing notice. Throwsters for the past year have been unusually busy with pressing orders, which they have found some difficulty, in many instances, of promptly filling, on account of the scarcity of help.

As a matter of scientific interest, we refer to a report made by a member of the association, showing that silk spooled in 1875 and recently tested by him, was found to have retained its life and strength to what was thought to be a remarkable degree, varying less than five per cent. For our own part, this percentage of apparent loss in the vitality of silk, we look upon as being quite large, rather than small, as indicating great deterioration in this animal product should it be kept several centuries, which does not compare favorably with wool, and even with linen and cotton, when it is considered that the latter two are of vegetable origin.

The secretary's report mentions the furnishing of the United States Textile Department at the Paris Exposition with a creditable line of silk exhibits, which we refer to in detail on page 669, this issue. While it is a matter of satisfaction that the silk industry is so creditably represented at this exposition, the fact that the United States government bears the entire cost of the exhibit, a privilege which is not extended to the other textile industries, is a feature open to serious criticism, in which the United States Exposition Commission is entirely responsible. It is very clear to anyone familiar with the textile industries of this country that there is nothing to be gained, pecuniarily, in the way of foreign trade, by either the silk or woolen industry, and very little by the cotton, by making exhibits at Paris. This applies to any industry that requires a high protection against foreign competition in American markets. If the silk exhibits are to receive assistance from the funds appropriated by the United States government for representation at the Paris Exposition, there is no reason why the wool and cotton exhibits should not be served in the same manner.

—The history of modern alizarine dyes dates from the discovery by the Farbenfabriken of alizarine-bordeaux B in December, 1890.

—Alizarine-purpurine is used in the printing of wool-slubbing with alumina for red.

Fall Overcoatings.

During the months of May and June the manufacturer of fall overcoats usually buys his stock, and many of those who make this class of clothes, depend on the left-overs from a light-weight season, so that the spring and fall overcoating fabrics are generally the same.

The fabric which has been used largely for the past few seasons is the covert, and this in all sorts and conditions from the all-worsted twist one to the plain cotton yarn fabric.

The highest priced lines must be made in a hard-twisted worsted, with plenty of picks and ends, and yet be made out of a fine yarn so that the fabric stands up well. The weight should be about 15 to 16 ounces, and the olive green colorings, and the gray effects, and the stone drab shades will be in greatest demand.

In an all-wool covert the same suggestions apply, and in this, greater care needs to be exercised, for if the yarn is not twisted tightly, the fabric will become slazy and this is bad, in this cloth, for an overcoat needs to retain its shape.

The imitation covert will have a large sale, and is made on a dark colored warp, using a white or light line filling and weaving on a five-harness satin weave. This, after gigging, presents a covert appearance, and should be made in all-wool.

The next thing to the covert in point of demand is the regular Venetian fabric, and the same shades are desirable here as in the covert, also the same weight fabric.

In this class of fabrics, Parker, Wilder & Co., and Deering, Milliken & Co. have held the market for some seasons, but the fabrics which they make are criticised by some buyers as being really lighter in weight than is desirable for an overcoating.

The Oxfords will still sell in the light-weight fabrics and should be shorn close, and as this is liable to make them tender, a stock must be used which will admit of this. Light-weight, that is, 16-ounce, meltons and kerseys, always have a moderate sale, and these fabrics should be made in tans, slates, Oxford mixes, slate mixes and olive mixes. In the kersey fabric the light cream tan is used in large quantities by the cloak trade, and it is necessary to have it free from spots, and the manufacturers who make this light shade have found it to their advantage to have the cards used boxed off, so that the specks from the darker colors cannot get into the lighter one.

There is a question whether fancy back coverts or Oxfords with a fancy back, will sell in light-weight fabrics; they have been made for several seasons, but have never been in great demand, although there is a call for a fancy back Venetian about 15 ounces in weight, for bicycle skirts, but these are not suitable for clothing, the fancy back being necessarily brighter than men desire; but a good hard-twisted worsted covert with a fancy back or a light color will find a moderate sale.

Some Heavy Weight Fabrics.

The present heavy-weight season is peculiar, in that the extremes of values are shown, that is, some fabrics seem cheap and others dear. The prices which are given are as nearly accurate as possible to obtain them, but in many instances the reductions which have been made have been done quietly, and with the intention of attracting as little attention as possible and are not generally known.

The Geo. H. Gilbert Manufacturing Co.'s goods sold through the Leavitt Department of Oelbermann Dommerich & Co., were one of the first to be reduced in price; they make a line of cassimeres which were opened at $1.50 and $1.25, and afterwards reduced to $1.37½ and $1.12½; these fabrics are made in dark patterns and show excellent value.

The line of worsteds made by this same mill were opened at $1.95 and afterwards sold at $1.80; the line as regards style was fair, the fabric being a wool warp back.

The fancy back Venetians and whip-cord effects, made also by Gilbert, opened at $2.20 and afterwards reduced to $2.15, were by comparison very high.

Stevens, Sanford & Handy had a line of cassimeres at $1.37½; the patterns were overplaided with twist, and were practically duplicated in a line shown by the same firm at 90 cents and contain some cotton. Braman & Valentine, agents, showed two lines of worsteds, one at $1.50 and the other at $1.42½; the patterns in both grades were neat checks and stripes and contain some cotton. The "Worth" cassimeres shown by this same firm and made by the Worcester Woolen Mill Co., were $1.50, the same plain weave face fabric being shown; the patterns were principally small checks.

This same mill also made a line of oxford suitings, about 18 ounces, for $1.10. Braman & Valentine, agents, had a three-quarter, eleven-ounce melton which was shown at 55 cents, and a three-quarter cotton warp one at 32½ cents, a black and blue cheviot at 75 cents, and another at 85 cents, and a coarse oxford overcoating at $1.50. A fabric for which there was quite a demand was the fancy back oxford coating. There were about three lines of these on the market, that sold by Greely, Cushman & Record at $1.42½, which were rather open and coarse in texture in comparison with some shown by Hyde & Jacobson at the same price. The third line was that sold by the American Woolen Co. at $2.00, and, of course, outclassed the other lines, being so much higher in price.

The Schaghticoke Woolen Mills had a line of cheviots containing twist which at $1.10 was one of the best values shown. Schnabel Bros. in Gifford's Department had a line, at $1.47½, all wool oxford overcoatings, and another at $1.65 which was a very good fabric, the gray mixes being exactly right.

Stursburg, Schell & Co. had a line at $1.35 which was fair. Ogden & Brook also had an oxford overcoating line at $2.00, and in oxford suitings the Schaghticoke had a line at $1.15 in herringbone and plain weaves; Jacob Wendell & Co. also sold a line of this same character at $1.12½, and a cassimere one at $1.10.

H. & W. H. Lewis offered a line of cotton cassimeres at 37½ cents and a through and through and warp backed worsted at $1.55. Henry W. T. Mali & Co.'s line of black and blue cheviots were 85 cents, and an oxford suiting fabric 95 cents, in both plain grays and overplaided with fancy thread. The same firm offered a line of oxford overcoatings with a fancy back, at $1.50, and a plain oxford vicuna overcoating at $1.90, which in comparison with other makes of same price was high. The Seneca Woolen Mills of Seneca Falls, New York, had a twist fancy back whipcord at $2.00 and these were made with a fine white cotton twisted on a woolen warp, the backs being coarse.

Callender & Austin's oxford overcoating line was shown at $1.35. Battey & Co.'s oxford suitings brought $1.25 and were an excellent fabric, only a shade above the demand. The Jacob Wendell overcoating oxford was $1.42½ and Kunhardt & Allen had fabrics of this character at $1.75 and $1.87½, which, as is usual with the productions of this firm, were an excellent fabric.

Nostrand & Moore sold a line of oxfords at $1.55 and showed the "Kent" cheviots made by Waterhouse of Centreville, R. I., at $1.30 and $1.37½. The American Woolen Co. had some remarkable differences in the prices of some of their fabrics, one line of cassimeres at $1.37½ was outclassed by another line at the same price; also a worsted for the same. The plain piece dye worsteds in black and blues were sold at $1.37½. A line of heavy twill effect worsted coatings sold at $1.82½ and contained some of the newest shades in olive and greenish mixes; the line of oxford coatings at $1.67½ did not show the value of some lines in the market for less

money. The cassimere effects in a cheviot fabric at $1.05 were excellent, as was also the oxford at $1.25 and the worsted oxford at $1.30 and the cassimere line at $1.20.

Accounting for Cotton Mills.

At the meeting of the New York Chapter of the Institute of Accounts, held at the Waldorf-Astoria, Thursday evening, March 29, an address on "Accounting for Cotton Mills" was delivered by A. O. Kittredge, F. I. A., C. P. A., president of the Account Audit & Assurance Co., Ltd., of this city, and also editor of Accountics, the Office Magazine. The address was made attractive to laymen and interesting and instructive to professional accountants as well, by the display of samples of the raw materials used by cotton mills and specimens of the product at various stages of manufacture up to the completion of the finest goods. There were also shown various charts and diagrams of special technical value.

At the outset the speaker set forth the objects to be accomplished by a system of accounts when applied to any business enterprise. These, stated in the concisest terms, are a perpetual or going profit and loss statement, and a perpetual or going balance sheet. "It is no longer satisfactory to the enterprising and aggressive business man," said the speaker, "to learn at the end of a long fiscal period, say six months or a year, what the results are of the business that has been transacted. Instead there is demanded a gauge of the business, showing at all times its measure of profitableness and its condition of solvency, that is as available for reference, and as correct in statement as is the thermometer that is employed to show temperature. A manufacturing enterprise is a complex problem compared with a merchandising undertaking. The latter buys and sells, with the costs of the goods handled on the one hand, and the selling figures on the other, constantly in contrast. In the mill or factory, there is first required of the accountant a going statement of the cost of the goods produced, comprised in the three divisions of materials, labor and general expense, and then a corresponding statement of the selling or commercial expense of the establishment.

"Costs of making goods have nothing to do with the expenses of marketing the goods. Nor is the outlay for distribution of the goods any proper part of the cost of production. However cheaply goods may be made, all chance of profit can be sacrificed by extravagance in selling expenses, and however well the sales department may be manned and however economically it may be conducted, profit will not follow unless the costs of making the goods are reasonable in amount. The manufacturer then has all the problems of the merchant confronting him, and, in addition, a long list of those which are peculiarly his own.

"Modern manufacturing consists of a series of operations. A well regulated mill or factory departmentizes to an extreme degree. The product of each of the several departments is the raw material of the next in succession, and therefore the costs of the goods in process must be shown at every stage.

"Cotton is first picked and carded and then slightly twisted, resulting in 'rovings.' Rovings under certain conditions are marketable, and frequently in the case of associated mills are transferred from one to another, and therefore their cost, including the cotton consumed, the labor applied, and their pro rata of general manufacturing expenses, must be shown as though they were the final result. This is necessary in order that transfers from one mill to another may be properly recorded. More especially is the cost record necessary because in the mill in which the rovings are produced they become the raw material for the yarn which next follows. Yarn must be similarly treated because it is the

raw material for the weaving or cloth department, and so on to the end.

"By 'costs' is meant actual costs day by day,—not estimates, nor yet general assumptions,—but instead an ascertained result, so nicely and accurately determined, that the total of the costs of all the articles finished in a given period shall exactly balance with the total charges to the mill or factory during the same period."

By way of summary or recapitulation, the speaker said that the adequate system of cost accounts, whether applied to a cotton mill, or to a factory in any other line, would show among other results the following:—

1. Either daily, weekly, or monthly, according to the time schedule employed, the cost value of the raw material on hand, both in gross and in as fine detail as desired.

2. At corresponding periods, the cost of the work in progress, either as a single unit, or preferably in each of the several departments in which the mill is operated.

3. At corresponding periods, the cost of the finished product on hand, in gross and in as fine detail as desired.

In the sales department, the speaker declared the showings would include among others a perpetual showing of the gross profits on sales, in contrast with the commercial or distributing expenses. This results in a "going" profit or loss statement. All these results, he assured his audience, are quite easy of accomplishment and really cost less in the way of clerical labor than the usual plans of bookkeeping. Besides this, the value to the business man is almost beyond estimate.

The general system of accounting referred to in the address is one that has recently been put into operation by two very prominent cotton mill corporations in the northern part of the country and by another in the South. The same system has been adapted to the requirements of various other industries, and is in use in many of the largest establishments throughout the nation, from bicycle factories to engine works and from publishing concerns to department stores.

History of Wool Manufacture in Great Britain.

Notes from Anderson's History of the Commercial Interests of the British Empire. Published 1762; Revised Edition, 1790. A Standard Authority.

960.

About this time, or rather somewhat sooner, according to the great Pensionary De Witt's Interest of Holland, Chapter II., Part I., the woolen manufacture of Flanders, and other parts of the Netherlands, which made so great a figure the six succeeding centuries, took its rise. That great man observes, "That till now, there were scarcely any merchants in all Europe, excepting a few in the republic of Italy, who traded with the Indian Caravans of the Levant."

"The Flemings, lying nearest to Flanders," continues De Witt, "were the first that began to earn their living by weaving, and sold the produce of their labor in that fruitful land (France), where the inhabitants were not only able to feed themselves, but also, by the superfluous growth of their country, could put themselves into good apparel. Baldwin the Young, or the third earl of Flanders, about the year 960, considerably improved the trade by establishing annual fairs or markets in several places, without any tolls being demanded for goods either imported or exported." The Flemish historians say that his father Arnold being very old, resigned the government to his son, in 959, who thereupon fortified the cities of Bruges, Ypres, Furnes, Bergen, or Mons, Bourbourg, Dixmude, Oldenburg, Rousselaire, Rodembourg, etc. He invited over into Flanders all manner of handicraftsmen for making all sorts of manufactures, to whom he granted great privileges. He also established many fairs at Bruges, Courtray, Torhout, Mont-Cassel, etc., and fixed markets at stated days in every week.

where merchants could exchange their goods for others; which was then practiced, according to the authors of those histories, because of the scarcity of money.

This judicious account from so great a man, must naturally carry conviction along with it, as what may be deemed an authentic, though brief, view of the rise of the famous Netherland woolen manufacture, probably prior to that of linen, the former being in a manner absolutely requisite for preserving men from the inclemency of the weather, the latter rather a species of luxury; many barbarous nations at this day living without any linen at all. As men engaged more in commerce, and consequently grew richer and more elegant, they gave the greater encouragement to so cleanly and desirable a commodity as linen to be worn next their bodies, etc. The linen manufacture came first from Egypt into Greece and Italy, and thence traveled westward to France and Flanders; next probably into Germany and England, before it got round in the more northern and northeast parts of Europe, where it has since prospered very much. Others think that the Carthaginians first introduced it into Europe.

It is almost unnecessary to remark in this place, that, at least, some sort of woolen cloth must ever have been made in all civilized countries; and that wherever the Romans planted colonies, they there introduced the weaving of cloth. Mr. Cambden, in his Britannia, speaking of the antiquity and eminence of the city of Winchester, says, "That there the Roman emperors seem to have had their imperial weaving houses for cloths of both woolen and linen for the Emperor and the army; and, most probably, that necessary art was preserved in Britain after the Romans quitted it, though perhaps in a plainer kind, till the fourteenth century, when King Edward III. introduced the fine manufacture from the Netherlands."

The city of Ypres, in Flanders, is said to have been now built. It has been long famous for the table linen manufacture, vulgarly called diaper, i. e., cloth d'Ypres, or of Ypres.

1090.

The Lord Chief Justice Hale, in his Primitive Origination of Mankind, makes the following instructive remark on this subject: "It appears very plainly by those ancient guilds that were erected in England for the woolen manufacture, as at Lincoln, York, Oxford, and divers other cities, that in the time of King Henry II. and Richard I. this kingdom greatly flourished in that art. But by the troublesome wars in the time of King John and Henry III., and also in the times of Edward I. and Edward II., this manufacture was wholly lost, and all our trade ran out in wools, wool-fels, and leather, carried out in specie; and that manufacture, during those warlike times, had its course in France, the Netherlands, and the Hanstowns. But by the wisdom and peaceable times of Edward III., he regained that art hither again, after near one hundred years' discontinuance. So that we are not to conclude that every new appearance of any art or science, is the first production of it."

1170.

The Weavers' Company of London is, without doubt, of great antiquity, and was probably in being before corporations, in the legal and modern sense of that word, existed. James Howell, in his Londinopolis, p. 123, gives us a sketch of the character of King Henry II., which, being without a date, we have here placed in the middle of that King's reign: "Granting to the weavers in London their guild, with all the freedom and customs they had in their grandfather's (King Henry I.) days, yielding yearly for the same to him two marks of gold." Stow quotes a charter of this King's importing, "That if any cloth were to be found of Spanish wool, mixed with English wool, the mayor of London should see it burnt. Which

shows the antipathy of English woolen cloths being made of Spanish wool."

1197.

We find in Selden's England's Epinomis, amongst the Capitula Placitorum Coronae of King Richard I., a plain proof that broadcloth was made in England. "Woolen cloth wherever it be made, shall be all of one breadth, viz., of two ells within the lists, and of the same goodness in the middle as on the edges." For it will hardly be supposed that King Richard would, or could, prescribe rules of this kind to all foreign nations in their making of cloth. Therein also we find directions touching the sale of red and black cloths.

1301.

We have seen and traced the antiquity of the famous woolen manufacture of the Netherlands, as far back as the year 960. It continued increasing for above four hundred years after, and was much taken off by France, Germany and England. Yet, as all things are liable to abuse, it happened, about this time, that the halls of those Netherland cities, which had at first made restrictive laws, under pretence of preventing deceit by the debasing of those manufactures (exactly answerable to our own mechanical companies in England, Scotland and Ireland), but which were, in reality, principally intended for fixing and confining them to the cities alone, forced, at length, much of this weaving trade out of the cities, where those halls exercised their restraints, into the villages. The wars between France and Flanders drove it back from those villages to Tienen and Louvain, in Brabant. "The Brabanters," says the great Pensionary De Witt, in his judicious book entitled the Interest of Holland, "nothing wiser than the Flemings, ran into the like restraining laws of the halls, of laying imposts on the manufacture; which imprudent methods had before occasioned many tumults and uproars amongst the weavers in Flanders; for, in the year 1300, in a tumult at Ghent, two magistrates and eleven other citizens were slain. In the year following above 1500 persons were slain at Bruges on the same account. And in a similar riot, and on the same score, all the magistrates of Ypres were killed. Some time after this, also, at Louvain, in a great tumult of the cloth-weavers and their adherents, several magistrates were slain in the Council-House, and many of the offenders fled to England, whither they first carried the art of drapery. Many other cloth-weavers, with their followers, as well Brabanters as Flemings, dispersed themselves into the countries beyond the Meuse, and into Holland, and, amongst other places, many of them fixed at Leyden." These cloth-workers, which are said to have taken refuge in England, seem to be the same with those mentioned in the Foedera, under the year 1351, who had licenses from King Edward III. and privileges granted by him for settling in England. From this great author we also learn, "That the cities of Ghent, Bruges, and Ypres, in Flanders, and Brussels, Tienen and Louvain, in Brabant, soon lost much of their trade and manufactures, partly by the ill-judged measures already related, and partly from their earls and dukes becoming so powerful as to make war against those and the other great trading cities of the Netherlands, whose cloth-trade, fishery and traffic were, on that account, gradually driven out of the land; whereas," says Mr. De Witt (who, however, must be still considered as a staunch republican, and ever glad to express his aversion to the monarchy and power of a Stadholder or single governor), "it is manifest, by the present manufactures, fisheries, and foreign traffic of the United Netherland provinces, that commerce thrives best in free governments; for when our earls or dukes were so weak and ill-armed that they were forced to submit to those cities that flourished by traffic, and could not op-

pose the true interest of the merchants, commerce then flourished."

1305.

Neither was Brabant in a less flourishing condition, in point of commerce and manufactures, at this time, under their Duke John III., and more especially the cities of Antwerp and Louvain; the latter of which cities carried on such an immense woolen trade in the beginning of this fourteenth century, that they reckoned upwards of four thousand wool drapers, clothiers, or master-weavers in that city, and above 150,000 journeymen weavers. Though surely the present site of this city never could contain so many people as there must have been in it by this computation; we must therefore suppose that at least the journeyman weavers did not all live within the city, but perhaps the most part in the adjacent villages. Louvain is indeed still a great city, its walls being about six miles in compass, though there is now much waste ground within them, which formerly might be built on; it has still twelve principal streets and above one hundred lesser ones.

1328.

In this same year, there is an English act of Parliament, cap. xiv., entitled, "The Measure and Assize of Cloths of Ray and of Color," whereby is directed the length and breadth of those two sorts of cloths, and that the King's Aulneger shall measure them; and they shall be forfeited to the King, if they be short of the following lengths and breadths, viz.: First, "the cloths of ray (not colored), were to be twenty-eight yards in length, and six quarters broad. Secondly, the colored cloths were to be twenty-six yards long and six quarters and a half wide." This is the first time we find any mention made of the office of Aulneger in the statute book; his designation coming from the measure then called an Aulne, now an ell. There were several other statutes afterwards made in this reign, for regulating the dimensions of cloth, and for the Aulneger's duty on cloths, and many more were made in succeeding reigns, which are not now worth out particular attention.

It may, and it certainly does, seem somewhat strange, that our English kings and Parliament should take upon them to limit the dimensions of cloth coming from foreign parts, yet that is asserted to have been the fact; and one John May, who was the general Aulneger, published a treatise, in the year 1613, called "A Declaration of the State of Cloathing, now used within the Realm of England," wherein he says, "That before the making of cloth, that is, fine cloth, in England, the Aulneger was ordained, who exercised that office upon all cloths coming from foreign parts, to measure and try them where they were put on land, even as far back as the fifteenth year of King Edward II., 1322, by letters patents." Yet as we, doubtless, made much more coarse woolen cloths at home, for our lower people, than were imported from foreign parts, it is probable that the above quoted act of Parliament had at least a more special regard to our home made cloth.

Printed Knit Fabrics.

Among the novelties of the coming season will be several lines of printed balbriggan underwear. Heavy weight overshirts and such goods have, we believe, been printed with some success, but it is only recently that the lighter and finer fabrics have been successfully treated in this way. In some of the samples we have seen, the fabric is quite well covered with block patterns, others are striped similar to goods made with a striping attachment, while others have variegated bars and stripes much resembling fancy Madras shirtings. Only one color is used, which is printed on the white goods in the piece, yet it permits the use of patterns of infinite variety and novel design. We understand that the concerns doing this work are rushed to their full capacity.

The Gobelins Tapestry Manufactory of the French Government.

LOUIS TURGAN.

(Continued from October.)

The operations already described are often modified in practice. Instead of first taking the deep shades, a commencement may be made with those in the middle of the series, followed by the lighter shades; and, if they should not meet requirements, the skeins of wool are not lost, but are added to those intended for the deep shades.

The substances contained in all dyestuffs dirty the baths, so that it is important to purify and renew the latter during the operation, and this with so much the greater care as the shades are lighter. When the color to be obtained is a compound, like the greens, the browns, etc., the bath should be watched even more carefully, the color which is most rapidly absorbed being renewed if necessary. All these operations are carried on at the Gobelins, in a laboratory rather than in a workshop.

During the last few years some aniline colors have been tried at the manufactory; but, in presence of manifestly unfavorable results, a return was made to the old products and traditions, indigo being used for the blues, woad for the yellows, madder and cochineal for the reds. The colors are even more brilliant than before, because pure substances and improved methods are employed, while the permanence is as great as ever. There are, however, no secrets at the Gobelins, all the receipts being registered and communicated to anyone who asks for them.

When the wools are dyed, washed, and dried, they are passed on to the storehouses, or are sent to Beauvais with the silks, which are largely employed at that establishment, and which are also dyed at the Gobelins manufactory. The wools keep perfectly well for several years; and when they are to be used they are rolled tightly into balls, and then mounted on spools or spindles (broches), which the artist-weaver chooses, just as a painter prepares his pallet. In the general storehouse of the tapestry ateliers there are about 11,000 bobbins of wool, and 7500 bobbins of silk; but all the series of colors have not the same number of shades, some of them having eight, and others as many as thirty-six. In the detail storehouse, where the weavers go for their supplies, there are about 34,800 spools of wool, and 6000 of silk, while another storehouse contains the unclassified wools and silks.

In the tapestry department, which has been managed by M. Munier since 1889, forty-five artist-weavers and pupils are engaged on the different pieces, working exclusively, as has already been stated, en haute lisse, i. e., vertically, although this method of manufacture is scarcely employed elsewhere than at the Gobelins. Works produced in this manner are generally considered superior, the execution being slower, although at the same time more perfect on account of the position of the loom; but it must be admitted that there is great difficulty in distinguishing products of the haute from those of the basse lisse. At the Gobelins are chiefly executed large decorative panels, with human figures, of 20 or 30 square metres (mean 269 square feet) area, which do not require such minute work as, for instance, depicting a bouquet of flowers for a chair seat.

Two of the three ateliers, containing, one three, and the other two looms, 13 feet by 24½ feet, may be visited by the public; and, excepting two of the looms, which are of iron, they are made of wood, being absolutely identical with those used in the 17th and 18th centuries. Two strong uprights, called "cotrets," carry two large horizontal rollers, that have received the name of "ensouples," which are made of oak or deal, and have at each end pivots turning freely in bearings, that may be shifted vertically in the groove of the upright. While both rollers revolve on their axes, it is gen-

erally the upper one only that is susceptible of vertical displacement. The iron looms, similar in general arrangement to those of wood, have among other advantages that of greater rigidity.

The vertical web in tapestry consists of woolen or cotton threads perfectly vertical, parallel and equi-distant, stretched on the rollers; and, in a groove extending the whole length of the rollers, there is a small wooden rod, called verdillon, for fixing the threads. When it is desired to roll up or unroll a portion of tapestry in course of execution, the rollers are rotated by means of levers inserted in holes made for the purpose; and, as the web is thus wound up on one of the rollers while being unwound from the other, the work is always executed at the same height. A little extra tension is given by an iron set-screw contained in the uprights, and acting on the roller bearings, while the rollers are locked in the position given to them so as to prevent their unrolling.

It is stated above that the threads of the web are stretched vertically and in the same plane; but this is only the case to a certain extent, because they are passed alternately over what is called a "baton de croisure," which is generally a glass tube one inch in diameter, while a string passed alternately between the threads contributes to maintain their distance apart. The threads are, therefore, in reality, divided into two sheets, those on the weaver's side being the "fils d'arriere," and those in front of the loom being the "fils d'avant." Over each of the latter threads are passed strings, designated "lisses," which have the form of rings, and are carried at the other end by a strong pole.

The weaver takes his stand behind the loom, with his back turned to the copy, of which he first takes a general tracing, in order to fix the position of certain points sufficiently far apart, the actual contours being drawn in full lines, and the principal tones being designated by dotted lines. This tracing is placed against the back threads of the web; and, with a small wooden style, previously inked, the artist traces upon the weft, thread by thread, the indications he has taken from the copy, the details being put in as the actual work proceeds. Although it is necessary to take these precautions, which permit of executing the work more correctly, too great reliance must not be placed upon them, as the threads become more or less displaced during the course of the work, and perfectly adventitious causes may modify this or that portion of the whole. The artist thus marks out his work; but he is chiefly guided by his artistic sense and the experience he has acquired.

The artist-weaver, who has at hand a great many spools with wool of various colors and different shades, takes one of these spools, after having determined the shade from his copy; and then he sets the end of the woof thread on the weft thread, to the left of the space where the shade is to be placed. He passes the spool from left to right, between the front and back threads, after separating with his left hand the threads that he desires to cover; and with this same hand he then draws towards him the front threads by means of the strings in the form of rings, while with the right hand he passes the spool backwards from right to left, thus drawing along the woof thread, which he presses against the previous one with the point of the spool. This stitch is all the mechanism employed; and the two operations which constitute it arrange the woof thread alternately at the front and back of the weft threads, while crossing itself between each of the latter threads.

The stitch may be made with a single weft thread, or with any number of them that the hand is capable of taking in; and, when finished, it is pressed down with a kind of strong comb the teeth of which, passing between the threads of the weft, close

up the woof in such a manner as to conceal the weft threads, although if the stitch should happen to be short it is simply closed up with the point of the spool or the middle finger of the right hand. It is by means of these stitches that the weaver depicts the design upon the weft, but in lines; and he has in front of him the wrong side of the fabric, on which side he cuts, sets off, and dissimulates the ends of the threads that begin and finish the stitches. It is the shades that determine the number of weft threads to be comprised in a stitch; and in a horizontal portion of uniform tint the stitches are made as long as possible so as to hasten the progress of the work. In the small details, however, it often happens that a stitch only includes two or three weft threads, the contours of the design to be reproduced, the various circumstances of the coloring, the greater or less extent of the lights and of the half tones determining the length of the stitches and also their number. Transition from lights to browns and from one tone to another is made by colors partaking gradually one of the other and arranged in hatchings. The contours determined, or formed, obliquely, to the direction of the weft by the various lengths of the stitches are not, for the most part, either rectilineal or regularly curvilineal, but always toothed. This arrangement, however, owing to the fineness of the woof threads, has no disadvantage whatever as regards the general effect of the objects represented, disappearing in the details of light and shade, and also in the hatchings, which are employed to graduate the tints, and also for avoiding the mosaic effect that would result from a simple juxtaposition of colors.

"La Rentraiture," is applied to all subsidiary work with the needle connected with tapestry, such as sewing together the various portions of a new work, and also the repairs made to worn or faded tapestries, while sometimes the borders are not woven on the same loom as is the tapestry, so that the two have to be united. All these operations, which are executed with great care and skill, are entrusted to a "maitre rentrayeur," having under him several workmen and workwomen.

When the work to be repaired has any break of continuity, such as a hole, the weft must be reconstituted by attaching new threads to the old that remain; and then, instead of passing the thread into the woof with a spool or spindle, the work must be continued by the needle. If however, the missing part is of large size, it is often more convenient to weave it in the loom and then insert it in its place.

All factitious methods for restoring old tapestries are strictly forbidden at the Gobelins Manufactory, for instance, that of scraping the wool and painting it with appropriate colors for restoring the original tone. The Atelier de Rentraiture besides doing work to tapestries belonging to the State, also undertakes repairs to those contained in private collections, and entrusted to the Gobelins for that purpose.

The carpet atelier, managed by M. Jacquelin, after having occupied nearly forty weavers in 1860 now employs only ten, because during the last few years the vacancies caused by decease, pensioning off and departures have not been filled up; but attempts are now being made to restore to this branch of the manufacture its former importance.

The weaving of carpets differs entirely from that of tapestry, the tissue produced by the artists of the Savonnerie being a pile, the weft of which is wool and the woof of very strong hempen threads. The looms are the same as for tapestry, although of larger dimensions—one has just been put up that is 40 feet long—and the artist, placed in front of his loom, works on the right (face) side of the work, having the copy above him, while the wool employed generally consists of five threads, having different tones but equal value, that harmonize.

For making the stitch the weaver

having chosen his spool, takes with the fingers of his left hand the weft thread on which he has to commence, and draws it slightly towards him, while passing behind it the spool with wool thread which he holds in the right hand; and he then draws towards him, by means of the string in the form of a ring, the next weft thread placed a little behind the first, surrounding the latter with a slip knot which he draws tight. Between these two passes the woof forms, in front of the weft, a ring the amplitude of which depends upon the height of the pile; and a round iron rod terminating in a blade, inserted in this ring, occupies a horizontal position, and becomes charged in succession with a series of wool rings formed by repeating the stitch, each knot being pressed down and tightened upon the tissue with the thumb and forefinger.

The act of withdrawing the tranche-fil, as it is called, from left to right cuts the wool rings; and, when a row of stitches is thus made for a certain length, they are joined together by two very strong hempen threads, passed between the two sheets of the weft and superposed at the points. This would not suffice, however, to form a strong fabric; but it is necessary to tie together the threads of the weft with another hempen thread forming woof. For placing it in the tissue the weaver brings the hind threads forward, passes the woof between the two rows of threads, presses it down with the comb, and then allows the hind threads to return to their position, taking care to allow this woof sufficient slack to permit its following all the inflections of the weft threads. In this manner the stitches are fixed, as it were, when the weaver presses down with the comb the stitches and the hempen threads, which latter enter into the fabric, becoming quite hidden therein.

The ends of wool thread are then picked apart by means of the needle in order that the contours may be well defined, after which the ends of the wool threads, previously cut by the tranche-fil, are sheared; and then, by means of scissors with curved—or rather cranked—handles, guided by a small board, the artist again shears the pile with great regularity, when he is able to judge of the effect produced by his work. In the kind of mosaic thus formed, of which the colored particles are the ends of infinitely small wool threads, the material is seen in section, instead of lengthwise as in tapestry; and, as the wool threads are perpendicular to the weft, they are flexible—a disadvantage inseparable from velvet pile, which should be borne in mind when choosing subjects for reproduction, because the least pressure may put the lines out of form.

Temporary exhibitions have been held from time to time in the galleries arranged for that purpose; but it was not until 1885 that the museum was definitely organized, containing tapestries spared by the fire in 1793, 1797, and especially 1871; gifts from the State or individuals, and also works purchased, while all the genres and every epoch are represented.

Among the most ancient pieces there are 236 Copt tapestries, that were discovered in Egypt; two ancient Chinese tapestries, one representing a stag and a doe, and the other a ram and a sheep; a cushion cover of the German school, dating from the 14th century; the Miracle du Landit, a Flemish tapestry from the Chateau du Plessis-Mace, and the Idole, all three of the 14th century; the Annunciation, and the Adoration of the Magi, both of the 15th century, that were bequeathed by M. Albert Goupil; Louis XI. raising the siege of Salins, remarkably well preserved, though dating from 1501; the Concert and the Shepherds, terminated a few years later; the Wild Boar of Calydon, the Ascension of Elijah, and Abraham's Sacrifice, that were woven in Paris at the beginning of the 17th century.

Owing to want of space, some curious fragments of tapestry, not woven, but embroidered, have been hung temporarily over other tapestries; the por-

trait of Louis XIV. after Rigaud, has been placed on an easel in the first gallery; and a great many hangings are scattered about in the passages, in the ateliers, and in the chapel; Venus at the Forge of Vulcan, after Boucher, a chef d'œuvre of the 18th century, is now exhibited at the entrance to the Atelier du Nord; and The Entrance of the Turkish Ambassador to the Tuileries is arranged on one of the vacant looms of the Savonnerie.

The ateliers themselves constitute, especially at the present time, the most magnificent museum of modern tapestry, because the subjects and the copies are most various, while their execution has attained the highest perfection.

Financial difficulties from the beginning of the 18th century prevented commissions being given to artists specially producing decorative paintings; and a beginning was made by recopying the works of Le Brun, and afterwards other paintings. Very soon the painters to whom commissions were given, when that was possible, quite ignored the exigencies of weaving; and the tapestry artists gradually accustomed themselves to the new genre, multiplying the shades, and producing exact copies of the paintings, after which there was a reaction, the late M. Turgan writing:

"Some are of opinion that the present method of working with judicious slowness should be maintained, and others that an attempt should be made, as far as possible, to apply the best methods now invented for simplifying hand work, the execution being hastened and the cost diminished. The former think that the productions should consist of paintings that are the most difficult to imitate, in order to maintain the distance which separates the work of the Gobelins from that of commercial establishments; and the latter, on the contrary, opine that all idea of reproducing paintings should be abandoned, but that attention should be exclusively turned to the production of splendid hangings, ornamented with arabesque flowers, and enriched with the precious metals."

During the last few years the intentional imitation of painting by tapestry has been abandoned, at any rate, in principle; and now account is taken of the essential structure of tapestry, the minutely fluted surface of which cannot render either a straight line or a circle, the lights of which have always a little shade, and the shades a little light, special subjects being created that may be executed with a small number of shades. Most of the pieces now being executed are conceived in this spirit, being veritable mural hangings; and the intended tapestry effect is evident at the first glance. "Le Tournoi," after J. P. Laurent, "La Mission de Jeanne d'Arc" and "Le Depart de Jeanne d'Arc," serving as types of this school; but such tendency is less evident in "La Justice Consulaire," of Maignan, "La Renaissance," of Ehrman, and the "Mariage Civil," of Claude.

A replica, or perhaps rather second edition, of the tapestry after Vigee Lebrun, "Marie Antoinette et ses Enfants," is now being executed as a present to the Empress of Russia; and there is every indication that the second will be superior to the first copy, which was woven at the beginning of the century.

While the production of the Gobelins manufactory increases every year, the execution remains at least as perfect as ever, if indeed it be not even more perfect; and, at the present time, great activity reigns in this "Dernier refuge d'un des arts somptuaires les plus magnifiques."

(Special to the Textile World.)

Russia, a Market for Textile Machinery.

Russia having about 45,000,000 common sheep and 15,000,000 merinos pasturing on the vast Steppes of Southern Russia, and producing from these sheep about 361,120,000 lbs. annually, or about 6 lbs. per sheep, may be called the first nation in Europe in the production of wool.

This large wool production acts as a great impetus to the growth of the woolen manufacturing industry which is now in a flourishing condition. European Russia alone has 485 mills employing over 80,000 men which produces annually over $22,500,000 worth of woolen goods, and new mills are being put up everywhere.

The immense progress in the cotton industry in recent years also offers many opportunities to manufacturers of textile machinery. The remarkable growth of this industry may be seen when it is known that in 1888 there were in operation in European Russia 79 cotton weaving establishments with 3,091,652 mule spindles, 262,146 flyer spindles, 559,008 ring spindles and 84,516 power looms, and that at the present time there are about 7,500,000 spindles and 250,000 looms employed in the industry.

The prosperity of these two industries creates an enormous demand for textile machinery which is partially satisfied by the home manufacturers and largely supplied by the British and Germans.

The principal Russian manufacturers of weaving and spinning machinery, and the only ones whose competition need be taken into account are Wechereck & Co. of Grodno, whose specialty is wool carding and spinning machinery, Dobroff & Nabholz of Moscow, manufacturers of looms, E. Kern of Lodz, manufacturer of plain and fancy looms, and the Moscow Mechanical Works of Moscow, who are large makers of ring spinning and winding and weaving frames.

The leading supplier of textile machinery for the Russian market, as well as for most of the European markets, is Great Britain. The latest available statistics of Russia giving the total importation of textile machinery, are those for the year 1897, when the total imports amounted to the value of $5,508,000 to which Great Britain contributed $3,474,375, Germany over $1,500,000, Austria about $250,000, France about $78,000, Belgium about $50,000 and the United States about $20,000. In 1898, according to the British export statistics, textile machinery to the value of $6,341,405 was sent by that country to Russia. The United States statistics do not separate the exports of textile machinery from those of other machinery, but it is known that our trade with Russia has increased largely, but not proportionately with that of the British or German.

It seems that proper efforts have as yet not been made by the American manufacturers to compete in the Russian markets, as most of them have been laboring under the erroneous impression that they could not compete successfully with English makers. The reputation of English textile machinery is, however, year by year more and more being wrested from it by the enormous progress made by the Saxonian manufacturers. The lesson quite recently taught us in our export trade should encourage us to make a more aggressive movement in the world's foreign markets, and as we have been able to compete with England in her own markets in other lines of machinery, it is more than probable that by energetic and systematic efforts we should be able to make a fair showing in competition with both England and Germany. It is a well known fact that, as a general rule, American machinery is lighter, better finished and superior to European makes in many respects, and that for these reasons it is imitated on the other side to a large extent. Our manufacturers should therefore take out proper patents in all countries where they intend to gain trade.

It cannot too often be repeated that the vast Russian Empire offers a very valuable market for American machinery. The Russians are exerting themselves to the utmost to develop the home industries. With the completion of the Great Siberian Railway, uniting European Russia with the Pacific Ocean, a vast interland will be opened up, thus increasing the demand for woolen and cotton goods. As a natural result, the Russian mills

will increase their capacity, new mills will be established, and the demand for textile machinery will keep pace with this growing industrial development. Nothing should be neglected by our manufacturers to secure a share of this trade.

Warsaw and Lodz, the two most important industrial centres (the latter alone having 264 textile works) should be at once invaded by our manufacturers. Commercial travelers should be sent, who speak Russian and who possess a certain amount of knowledge of the people, and all correspondence and printed matter should be in Russian if possible.

It would also be advisable to open correspondence with large firms, who are interested in textile machinery, such as: John M. Summer & Co., Piatrkowska, 101, Lodz; Eduard Tojel & Co., Lodz; The J. Block Company, Warsaw, and M. Bramson, Erywanska, 16, Warsaw.

The Capitalist and the Workman.

Edward Atkinson recently made a statement at a meeting of a workmen's association, to the effect that workmen, in any given art to which science and invention had been applied by capitalists had been securing to their own use and enjoyment an increasing share of a constantly increasing product, while the capitalist has secured a diminishing share of the increasing product. Yet, by the enlargement of the works and the increase of demand for goods, that lessened margin of profit may yield a larger gross income, not, however, relatively so great as the increased income of those who do the actual work. This apparently paradoxical statement has been proved from every line of investigation of every art which Mr. Atkinson ever examined. In explanation of this, Mr. Atkinson says:

"That as the conditions of a cotton factory, especially one which has been operated throughout a long period on the same cloth, are more easy of access, I have been accustomed to use the figures of the cotton mill on heavy standard sheetings as an illustration of the principle laid down. My memory of figures is good except as to dates, and in quoting from memory at the meeting I gave a date 1840 which should have been 1830. From the figures of two factories combined I illustrated the law of competition that in any given product profits diminish while wages increase. In my book upon the 'Distribution of Products' the figures are given, dating from 1830 to 1884, and as these were exact figures I will state the case from them and then state the further progress approximately. In 1830, not 1840, the average earnings of an operative in a standard sheeting factory for one year were $164. The average product was less than 4200 yards. The cost of labor per yard was 3.76 cents. The profit required to pay 10 per cent. on the capital was two and four-tenths cents per yard. The hours between bells were 14 per day. The actual hours of labor 13. The mill was low studded, badly lighted and badly heated. In 1884, the average earnings per operative were $290. The average product was 28,000 yards. The cost of labor per yard was one and seven-hundredths cents. The profit per yard necessary to pay 10 per cent. on the capital was a little over four-tenths cents. The hours of labor were 11 per day. The mill of 1884 nominally the same, practically it was a new mill filled with modern machinery, high studded, well ventilated, well lighted. These are exact data from the books. Since 1884 the progress has continued. The earnings are now about $320 a year. The product per operative about 32,000 yards. The profit required to pay 10 per cent. on the capital approximately one-quarter of a cent per yard. The hours of labor are now, I think, 58 per week. The prices of the fabric have varied with the price of cotton, but are now very much less than they were from 1830 to 1850. Herein are facts proving: 1st, That the consumers have gained a large part of the benefit of improved methods in the price of the cloth. 2d,

That the wages have about doubled on terms of money. 3d, That the proportion of the product falling to capital has been reduced from two and four-tenths cents necessary to pay 10 per cent. on the capital in 1830, to one-quarter of a cent necessary to pay 10 per cent. on the capital in 1899. Neither of these mills has averaged 10 per cent. per annum during the period from 1840 and 1899, but much less. The fallacy of Mr. Chase's remarks at the meeting and in his question is that he computes the wages against the value of the product at a certain percentage. There is no relation between the wages of the factory and the value of the total product, because the labor of the factory constitutes less than 25 per cent. of the cost of the goods. The rest is made up in the cost of the materials and the general expenses which vary very greatly; cotton having varied in the period under consideration from 6 cents a pound to $1.80 a pound at the mill. The true method of determining the question at issue is to convert the earnings of the operatives at different periods into yards of cloth. In 1840 the price of the goods was a fraction over nine cents. The wages of 1840 were $175, equivalent to 1944 yards of cloth or of the product of the operative. The wages of 1898 were approximately $320 a year. The price during the year was as low as five cents, which would represent an increase of over 200 per cent., 6500 yards. Since then the price of cotton has advanced, wages have been augmented, the price of the cloth is now six to six and a quarter cents. Again, had the operative been paid in kind and not in money, each yard of cloth produced in 1898 would have exchanged for more of the ordinary necessaries of life than each yard of cloth would have exchanged for in 1830 or 1840, indicating a gain to the workman, both absolutely and relatively."

--The precious purple of the old Greeks and Romans is made from the juice of the purple snail.

Textile Machinery Building in the South.

From time to time the project of establishing in the South a plant for the manufacture of textile machinery has been proposed without any material progress being made toward its establishment. Within the last few weeks, however, a movement has been inaugurated and active steps taken toward this end, and a large amount has been subscribed to the capital stock of such a company. The plan has its inception with Mr. H. G. McKerrow, the well-known importer of cotton machinery and the American agent for Tweedales & Smalley of Castleton, Eng.

Mr. McKerrow first secured the cooperation of a number of Northern capitalists interested in cotton manufacturing and cotton machine building, and at the same time a similar project was under consideration by Atlanta people, where this idea has met with special favor. The two projects have been consolidated; a considerable sum has already been subscribed in Atlanta, and a committee appointed by the Business Men's League, which has issued a prospectus soliciting additional subscriptions.

The promoters feel that this enterprise has much to commend it as a business and a profitable investment. At the present time there are nearly 5,000,000 spindles in the South and great activity in cotton mill building. While this is not likely to continue at its present rate indefinitely, there will be a market for a large amount of machinery such as will be built at these works, and they feel that with low cost of raw materials, saving in freights, etc., this concern will be in an advantageous position to bid for this trade in competition with the Northern shops, none of which are located nearer than Providence.

The company which is being formed will be known as the Southern Textile Machinery Co., with about $350,-

000 paid-in capital, of which it is expected that $100,000 will be subscribed in Atlanta, and the balance taken up in the North. It is Mr. McKerrow's idea that this plant shall be equipped with thoroughly modern labor-saving machinery, so as to reduce the cost of production to the lowest possible point. At first only cards and drawing frames will be built after well-known models, and it is planned at first to turn out about 12 cards and 24 deliveries of drawing per week. As the success of the enterprise warrants, its line will be extended.

In addition to the manufacture of new machinery, it is proposed to enter extensively into the supply of repair and spare parts for the machinery already in operation.

Mr. McKerrow sailed for England on April 7 in the interest of the new company, and upon his return expects to carry the plans forward to speedy consummation.

Dutch Influence on English Manufactures.

In considering the contributions made by the Low Countries in Europe to civilization in America, we must begin by considering their contributions to civilization in England, and we shall find that these were many and important. There is no doubt that the commercial and social relations between Britain and the Continent were greatly multiplied and strengthened by the Norman Conquest. In particular, the relations with Flanders grew closer, and we find a party of Flemings, driven from home by floods, seeking and obtaining permission from William Rufus to make a settlement in England. This was accomplished about 1112 under Henry I., who planted the new colony in Pembrokeshire, to serve as a buffer against the Welsh. Thence, if Fabyan is correctly informed, they spread into other parts of the island, and already they were known as skilful weavers, insomuch that about 1150 David I., of Scotland, by special privileges, induced some of them to come and settle north of Tweed. But a long time was yet to elapse before England was to become a manufacturing country. For the next two centuries all the better grades of woolen cloth came from the Flemish cities. The wool grown on British sheep was the best in the world, and most of it went to Flemish looms, whence some of the fine cloths made from it came back to clothe the people of Britain, while the rest were sent all over Christendom, and even into the dim, vast Orient. Throughout the later Middle Ages, and into the seventeenth century, one is struck with the singularly close and steady alliance between the Low Countries and England. Along with divers political causes for this alliance there was one permanent and pervading economical cause. A failure in the supply of English wool was as paralyzing to the Flemish weavers as the failure in the supply of American cotton during our late Civil War was paralyzing to the great manufactories of England; while conversely any flagrant disturbance of manufacturing in Flanders would spoil the market for the English sheep farmer. Wool was symbolic of the wealth of the two countries. In glorification of Netherland industry Duke Philip of Burgundy instituted the order of Knights of the Golden Fleece, and in the House of Lords at Westminster the Lord Chancellor still sits upon the woolsack.—Fiske.

—It is better to use one dyestuff to produce a given shade than two or three, for there is more certainty of producing the desired shade each and every time that shade is wanted.

—The year 1826 is the date of the discovery of artificial ultramarine by Ymelin, although he was deprived of the fruits of his labors.

—One of the difficulties of dobby productions is the formation of figures on a ground work which is itself studded with small spots or dots.

COTTON DEPARTMENT.

American Cotton Spinning Machinery.

ARTICLE XIV.

CHARLES CLIFTON HEDRICK.

(Copyright.)

In the manufacture of the finer qualities of yarn, which demand long staple cotton, the combing process, which is necessary, follows carding, although the card sliver is very often subjected to one process of drawing before it is combed. Briefly speaking, the operation of combing, which is entirely different from all other branches of cotton spinning, consists in removing the short fibres and neps which remain in the sliver after carding.

Combed yarns are used for various purposes, among which may be mentioned hosiery and underwear, sewing thread, laces and fine cotton fabrics.

In considering the uses for combed yarns, three important points should be kept in view in order to thoroughly understand the merits of combing, first, the length of the cotton fibres, second, the twist per inch in the yarn, and third, the counts of yarn spun.

Yarn depends mainly for its strength upon the amount of twist it contains, and the length of the fibres. For hosiery and underwear, it must be soft twisted, so that it will feel smooth to the touch, and, in order that it shall be sufficiently strong, long staple cotton must be used.

Yarn for thread and fine cotton fabrics is much harder twisted, and, as the fine numbers of yarn contain comparatively few fibres per cross section, they must be long enough to receive a sufficient number of twists.

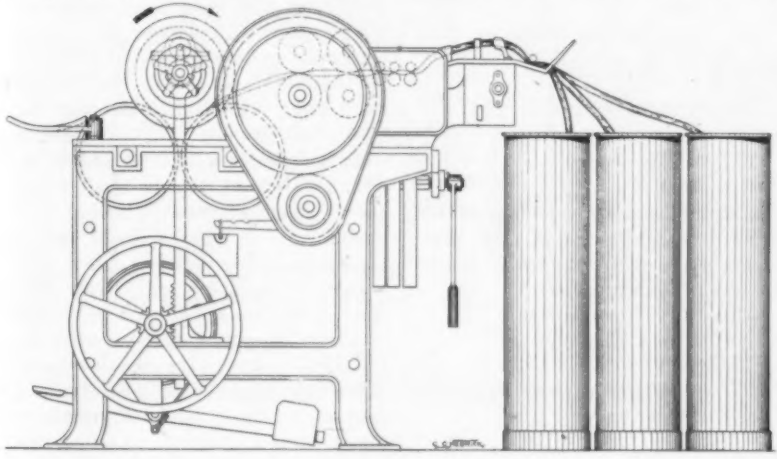


FIG. 92.

It will thus be seen that the fibres in combed yarn must be approximately uniform in length, which result can be obtained only by combing.

There are generally three machines used in the combing process, viz.: the sliver lap machine, the ribbon lapper, and the comb, although very often the ribbon lapper is not used. In that case, the slivers, after leaving the card, are put through one process of drawing, and from the drawing frame are put through the sliver lap machine and made into a lap for the comb. When all three machines are used, the drawing process is usually omitted before combing, and the rib-

bon lapper which corresponds to it is used instead. But in all cases, the sliver lap machine is necessary to prepare the lap for combing, and two or three drawing processes are necessary after combing.

To make this perfectly clear, the different arrangements of the machines used in combing are given below, in their respective order.

When the ribbon lapper is used, the machines employed are:

1. Sliver lap machine.
2. Ribbon lapper.
3. Comb.

When the ribbon lapper is omitted:

1. Drawing frame.
2. Sliver lap machine.
3. Comb.

When the drawing frame is used with the ribbon lapper, the following are used:

1. Drawing frame.
2. Sliver lap machine.
3. Ribbon lapper.
4. Comb.

Sometimes double combing is resorted to for the very best yarn. The machines are then arranged in one of the two following orders:

1. Sliver lap machine.
2. Ribbon lapper.
3. Comb.
4. Sliver lap machine.
5. Ribbon lapper.
6. Comb.

If the ribbon lapper is omitted:

1. Drawing frame.
2. Sliver lap machine.
3. Comb.
4. Drawing frame.
5. Sliver lap machine.
6. Comb.

The sliver lap machine prepares the laps for the comb by laying the card or drawing frame slivers, as the case may be, in the form of a narrow sheet, which is wound upon a wooden core or spool into a lap 12 inches to 14 inches in diameter. The number of slivers at the back of the machine depends upon their weight and the width of the lap to be made. In the earlier types of these machines, the laps were made 7 to 9 inches in width, but the present ones are built to make a lap 10 to 11 inches wide. This will require fourteen to twenty slivers, and, as the laps must be free from thin places, the machine is provided with a stop motion which instantly operates, when a sliver breaks or a can becomes empty.

An elevation of the machine is shown in Figure 92 and a section in Figure 93. From the cans A, the slivers are drawn over the stop motion spoons B and through the guides C and between three pairs of draft rolls D, E and F, where they are subjected to a slight draft, from two to three usually being sufficient, as all that is required is to straighten the slivers slightly, so that the needles of the comb may deal more gently with the fibres, particularly when the ribbon lapper is omitted between the sliver lap machine and comb. From the draft rolls, the slivers next pass between two pairs of heavily weighted, smooth calender rolls H H and H H, and are formed into a thin, fleecy sheet which is drawn forward and wound upon a wooden spool into a lap, which is revolved by contact with a pair of fluted lap rolls N N. The ends of the lap are formed by a pair of plates M, which revolve with the lap, thus making very even selvages.

Directly beneath the lap rolls is a friction or break pulley S, which is keyed upon a shaft T. Around this pulley is a leather strap W, both ends of which are fastened to a foot lever O, which is hung upon a stud V. Upon the long end of the foot lever is a weight X. The lever is balanced so that the weight keeps the strap tight around the break pulley at all times. Upon each end of the shaft, with this pulley, is a pinion R, in gear with a rack P, the end of which is connected to the lap roll arbor L, which passes through the lap roll upon which the lap is wound. As the lap increases in diameter, it draws up on the racks, the upward movement of which is retarded by the friction of the strap around the break pulley. By this means the laps are wound very firmly and compactly.

In addition to the back stop-motion,

the machine is provided with a full lap stop-motion, or measuring device, whereby the size and weight of the laps may be governed. This is operated by a projecting piece on one of the racks, which comes in contact with the stop-motion arm, as the lap reaches its full diameter. To remove the lap, the attendant presses down upon the foot lever, which releases the strap from around the break pulley. The lap is then raised clear of the lap rolls, by the hand wheel N^1 and the arbor drawn out.

The draft rolls are dead weighted, consists of a heavy iron piece lined with clearer cloth. The under side of this piece is shaped to fit the outline of the calender rolls, its weight holding it firmly down upon them. The clearer F^1, for the under pair of calender rolls, is also shaped to fit the rolls, but is of wood instead of iron. It is held up against the rolls by a counter-weight H^1, which is hung upon a stud L^1. The draft rolls are also provided with a clearer D^1.

In addition to the weight of the top calender rolls themselves, they are lever weighted; the rod E^1 connects

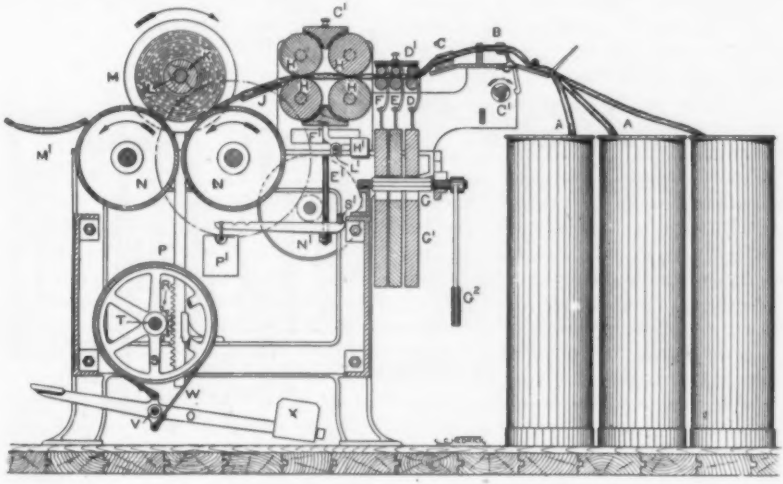


FIG. 93.

each roll having an independent weight G^1, hung by stirrups in the usual manner. In each weight is a square hole, through which extends a shaft G, which has a cam-shaped projection along its face. This shaft is supported by bearings at each end, and at one end is also a handle G^2, by which the shaft may be turned. When it is desired to remove the weight from the draft rolls, this shaft is given a quarter revolution and its cam-shaped face brought against the upper side of the hole in the weights. In this manner, the weight may be entirely removed from the rolls and borne by the shaft.

The top pair of calender rolls is provided with a top clearer C^1, which the yoke, which is over the bearings of the top rolls, with the weight lever N^1, upon which is the weight P^1. The fulcrum for the weight lever is a projecting lug S^1 upon the frame of the machine.

Figure 94 is a plan of the gearing of the sliver lap machine. To find the draft, multiply the number of slivers entering at the back, by their weight per yard, and divide the product by the weight of the lap per yard.

Example:

Number of slivers, 16.

Weight of slivers per yard, 42.5 grains.

Weight of lap per yard, 272 grains.

$(42.5 \times 16) \div 272 = 2.5$ draft.

This will require a draft gear of 55

teeth which is shown on the plan of the gearing.

To find the production of the machine, multiply together the revolutions of the calender roll, the circumference of the calender roll, the weight of the lap per yard, and the minutes run per day, and divide the product by 7000 (the number of grains in one pound) multiplied by 36 (inches in one yard).

Example:

Revolutions of the calender roll per minute, 60.

Circumference of 5-inch calender roll, 15.70 inches.

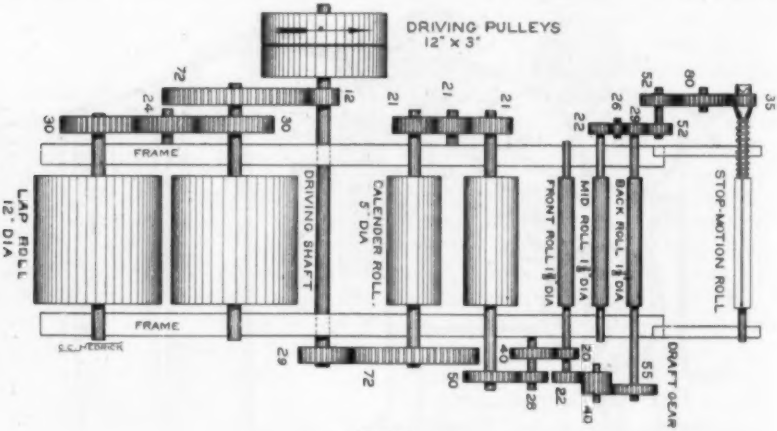


FIG. 91.

Weight of lap per yard, 272 grains.

Minutes run per day, 600 (10 hours).

$(60 \times 15.70 \times 272 \times 600) \div (7000 \times 36) = 153{,}734{,}400 \div 252{,}000 = 610.5$ pounds.

From this amount should be deducted about ten per cent. for time lost in doffing.

By examining the diagram of gearing, it will be seen that on the end of the driving shaft is a pinion of 29 teeth, which drives the calender roll gear of 72 teeth. The driving pulleys thus make 2.48 revolutions to one of the calender rolls. The speed of the driving pulleys is from 125 to 250 revolutions per minute, usual speed about 200.

The ribbon lapper, which is used as an intermediate process, between the sliver lap machine and the comb, is in one sense a drawing frame, except that the fibres instead of being drawn in the form of a sliver, are spread out in a sheet. The laps are placed upon lap rolls side by side, at the back of the machine, six usually being the number for each lapper. The laps are drawn full width between a set of four draft rolls usually having a draft of six, and they pass down a curved plate and under a calender roll, which operation brings them together one over another, upon the table of the machine, thus forming a lap of six thicknesses; but, as the lap has been subjected to a draft of about six, the combined weight is the same as it was at the back of the machine. From the calender rolls, by which the laps are drawn along the table, they pass between two pairs of heavily weighted calender rolls, which consolidate the six laps. This sheet now passes forward and is wound, by contact with two lap rolls, upon a wooden spool. This prepares the lap for the comb, the lap-forming arrangement being the same as that on the sliver lap machine.

The laps put in at the back of the ribbon lapper are usually made about one inch less in width than those required for the comb, as the lap spreads some, when passing through the drawing rolls.

The ribbon lapper is provided with two stop-motions, one, which stops the machine immediately, if a lap runs out, and one, called a full lap stop-motion, which regulates the length of the laps, so they may be all wound to the same diameter.

The production of the ribbon lapper is usually about the same as on the sliver lap machine, the method for calculating the production being the same for both machines.

Types of Woven Fabrics.

THEIR CHARACTERISTIC FEATURES, CONSTRUCTION AND MANUFACTURE.

ARTICLE IV.

HARRY NISBET.

(Copyright.)

The term "damask," like the term "brocade," is of very ancient origin, and is still used to designate a particular type of fabric. It is said to have been originally applied to the richly decorated and costly fabrics composed entirely of silk, first produced by the skilled weavers of the city of Damascus. Hence the term "damask" by which they were known, but which is now applied indiscriminately to fabrics of any material that bear any resemblance to the original productions of that name.

Damask fabrics are of two kinds, namely, "simple," in which one system each of warp and weft is employed, as exemplified in table covers, table linen, light curtains, and hangings; and "compound" in which one system of warp and two systems of weft are employed, as in furniture damasks, and heavier makes of curtains and hangings.

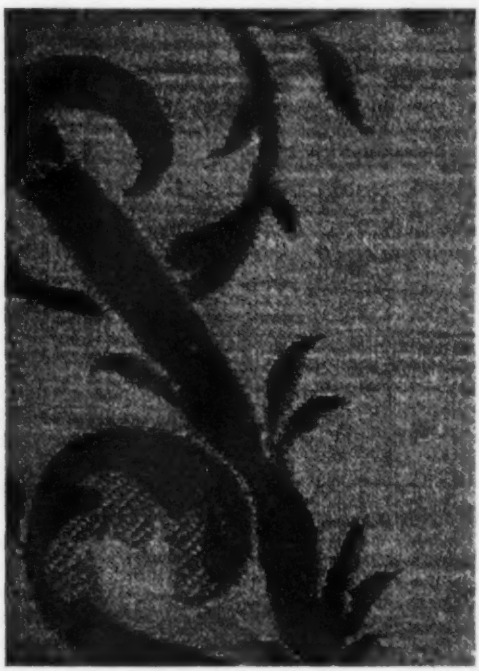
Damask fabrics in general are characterized by a figure of warp-face satin upon a ground of weft-face satin; or a twill weave may be used for both figure and ground; or, again, twill may be used for one, and satin for the other, as in example represented by Fig. 20. Those constructed on what is known as the true "damask" principle are further characterized by a more or less coarsely stepped margin of figure and ground, caused by controlling warp-ends in groups of two or more at a time by the figuring harness and inserting two or more picks to each pattern card for the formation of figure, although both warp and weft interlace separately in some definite order for binding purposes.

It will be seen from the foregoing, that damasks differ from brocades not in principle of construction, but in the manner of developing figure upon them. In brocades a variety of binding weaves may be employed in both figure and ground; also, warp and weft may exchange places in any desired manner (excepting when woven with a "split tie-up"), whereas in damasks, a simple satin or twill weave only is employed for both figure and ground. Of course, when designing for so-called damasks, in which each individual warp-end may be controlled as desired, it is a common practice to introduce a variety of binding weaves in the development of figure to give additional attractiveness; but these partake more of the character of brocades than of damasks, and more properly belong to that class.

It is in the mechanism employed in the production of damasks rather than their construction, that the greatest interest attaches. The extreme fineness of texture that usually obtains in these fabrics, especially those of silk or fine linen containing sometimes as many as 400 threads per inch, places them far beyond the scope of jacquard machines of reasonable dimensions, even for designs repeating on a few inches only; and to mount a sufficient number of ordinary machines would not only incur enormous expense, but would oftentimes be impracticable.

To overcome these difficulties, and to enable damasks to be produced with the greatest economy, many very ingenious methods have been devised

whereby a considerable number of warp-ends may be commanded by a comparatively small number of hooks, needles, or both, in the jacquard machine; also, by using each pattern card for several picks in succession, a pattern repeating on a large number of picks may be woven with a quarter, third, or half that number of cards, according as each of the latter is used for four, three, or two picks respectively.

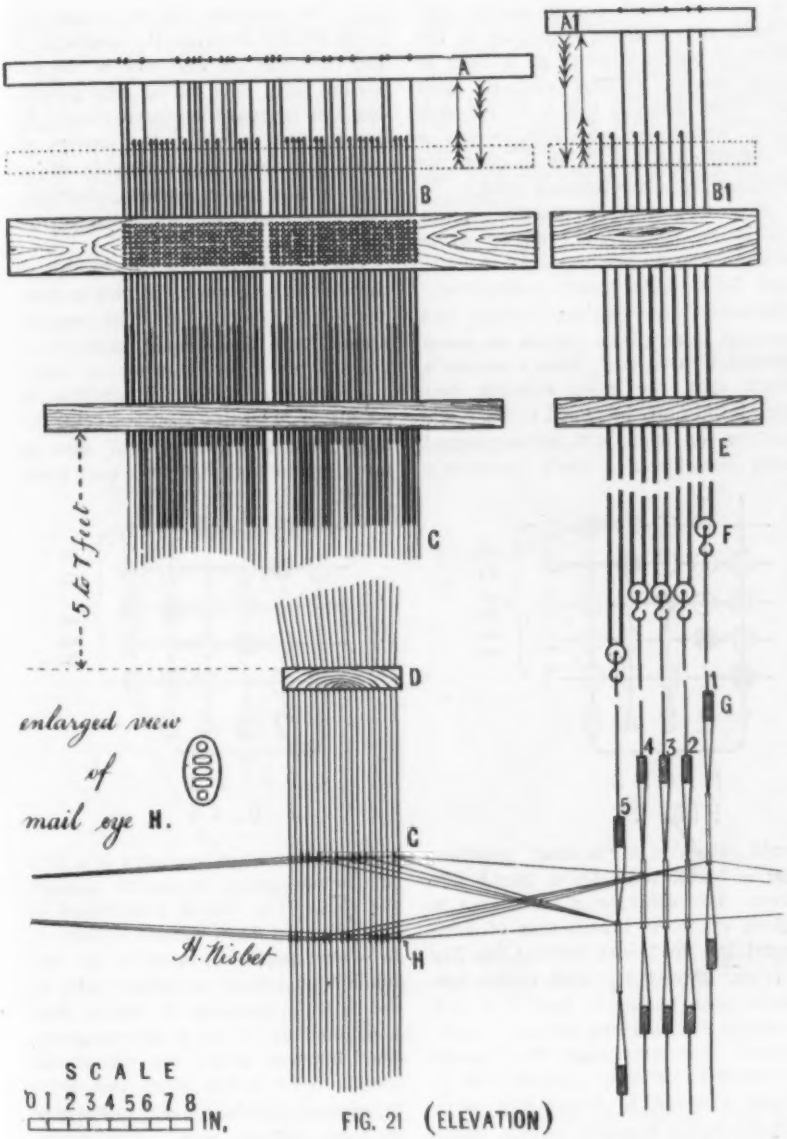


PLAN 5.

Although each of these methods operate in a different manner in attaining the same result, they are all based upon the same principle, namely, the governing of warp-ends en masse for the formation of figure; and individually for the purpose of binding warp and weft in some regular order.

The best known of these arrangements, and the one most suited for very fine fabrics is that known as the "compound pressure harness" illustrated by Figs. 21 (elevation) and 22 (plan). It consists of an ordinary jacquard figuring harness C that operates in conjunction with a heald harness G for binding, comprising any reasonable number of healds (in the present case—five). Both harnesses control the same warp ends, but in a different manner. After passing through mails H of the jacquard harness in numbers of two, three or more together, they pass separately through heald eyes G1—G5 so as to form a five-shaft "straight-through" draft as indicated in plan Fig. 22. Heald eyes are made much longer than usual in order to permit of a full jacquard shed being formed within them. After a shed is formed, healds occupy three positions, namely, a "top" position as No. 1; a "neutral" position as Nos. 2, 3 and 4; and a "bottom" position as No. 5. They may be actuated by means of tappets, a dobby, or jacquard hooks B1, which are raised by a griffe A1 operated independently from griffe A that lifts figuring hooks B. Each heald is controlled by two hooks which are connected by a cord E supporting a small pulley and hook F. Healds are suspended by cords passing from pulley-hooks; and are pulled down, after being raised, by means of weights or springs. By lifting two hooks B1 that are connected, a heald is raised to the "top" position; by lifting one hook only it is raised to a "neutral" position; and it remains at the "bottom" when both hooks escape the griffe.

It is the function of the jacquard figuring harness to form the pattern by raising warp ends en masse for figure, and by leaving them down en masse for ground; and it is the function of healds to form a binding weave throughout the fabric, by raising some of the warp-ends which are left down, and by keeping others down which are raised by the figuring harness. This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of
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H
SCALE
0 1 2 3 4 5 6 7 8 IN.
FIG. 21 (ELEVATION)
D
G
H.H.
5 4 3 2 1
FIG. 22 (PLAN)

is accomplished by governing the healds in a manner according to the binding weave desired, as a twill or satin weave. At least one heald must be raised, and one left down for each pick, whilst the remainder occupy a "neutral" position so as to cause no obstruction to the figuring shed.

Figs. 23 and 24 are shedding plans indicating the manner of operating healds so as to produce a 5-end twill, and 5-end satin weave respectively. Horizontal lines represent healds, and vertical lines, picks. When an intersection of two such lines contains a black spot, the latter signifies that such heald must be raised to the "top" position on such pick as correspond with those lines. A circle indicates a

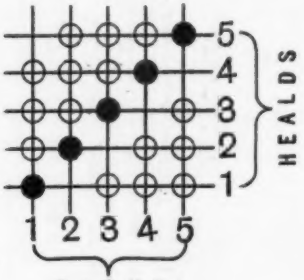


FIG. 23

heald raised to a "neutral" position; and a blank indicates a heald left down. For example, a black spot is placed upon the intersection of horizontal line No. 1 with vertical line No. 1 (Figs. 23 and 24); and circles are placed upon horizontal lines 2, 3, and 4; whilst 5 is blank on the same vertical line. Therefore, heald No. 1 would be raised to the "top"; healds Nos. 2, 3, and 4 would be raised half way; and heald No. 5 would remain down on the first pick, and so on.

As previously stated, each pattern card may serve for several picks in succession. This is accomplished by keeping the jacquard machine raised for such number of picks as are required to be inserted for each card, and then changing the card for the next series of picks.

As the machine must be up on every pick, the changing of cards must be done quickly between the last pick of one card and the first pick of the following card. The lifting cam governing the jacquard machine should be constructed to effect the change as easily and smoothly as possible, otherwise it will cause considerable vibration to the harness, and consequently bad weaving.

The construction of a cam to change the shed after every third pick is demonstrated by Fig. 25. The cam is divided into three equal parts, 1, 2, and 3, each representing a pick. Two-thirds of the third division is consumed in closing the shed after the third pick is inserted, and also in forming a new shed for the next three

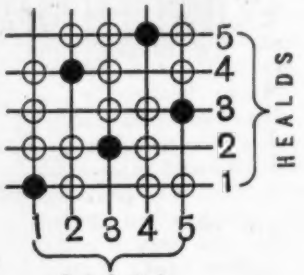


FIG. 24

picks. This allows one-third of a pick for the passage of the shuttle through the shed. The cam is constructed to the following data: Centre of cam A, to lowest point K, equals 2 in.; distance from lowest to highest point C, equals 3 in.; diameter of treadle bowl J, equals 2 in. B and D are imaginery lines between which the pin of the treadle bowl moves when the latter is passing from the highest to the lowest point, and vice versa. The portion F I, of the third division, equal to two-thirds of a pick, is divided as follows: F G, equal to five-twelfths, employed for closing the shed; G H, equal to one-twelfth, for a pause; and H I, equal to six-twelfths, for opening the shed. A little more time is allowed for opening, than for closing a shed, in order to make it easier for lifting. Divisions F G, and H I, are

each divided into any number of equal parts (in this example, six), by radial lines. These are intersected by concentric lines to form a corresponding number of unequal divisions between lines B and D. These unequal divisions may be readily obtained by describing a semi-circle L on any

between its extreme positions. By describing circles from each of these points, equal in diameter to that of the treadle bowl, and then drawing curves, tangent to them and connecting the highest and lowest points of the cam, the outline of the latter is completed.

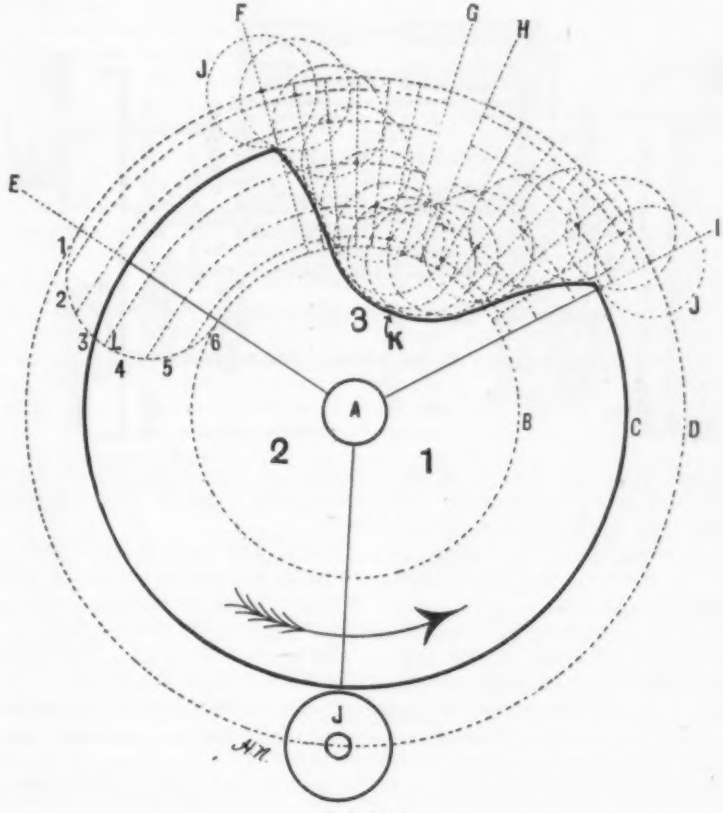


FIG. 25.

radial line between circles B and D, and dividing its arc into six equal parts, 1, 2, 3, 4, 5, and 6. By projecting lines from each intersection of the arc to cut the diameter at right angles, the six unequal divisions are obtained. The intersections of consecutive radial and concentric lines,—commencing on the outer circle D at F where the shed begins to close,—indicate different points in the path of the centre of treadle bowl as it moves

—During the fourteenth and fifteenth centuries small quantities of indigo found their way into Europe, along with methods of application, the Italians being the first people in Europe to use it.

—Alizarine-red, whereof numerous blue to yellow shade brands are supplied, serves before all for the production on alumina mordant of turkey-red on pieces and yarns.

Cotton Combing.

ARTICLE VII.

Rule 8. For timing the nipper, set the pointer at No. 9½. Loosen the screw on the nipper cam and turn cam around until nipper stop screws just leave the stand.

Rule 9. Set top comb to leather, detaching roller with 1/64 in. gauge. Remove end bearings from detaching roll and put gauge between it and steel detaching roll. Then incline top comb at 31 degrees, remove gauge and see that rolls are free.

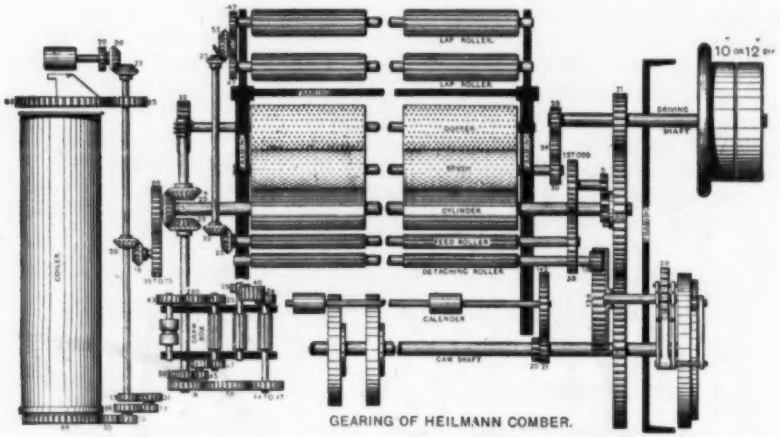
Rule 10. Set top comb to fluted segment with No. 20 gauge by first loosening all set screws on shaft and setting with stop screws on both sides. After setting put a strip of paper under each screw and have them draw out with the same tension.

Put the eccentric on its downward throw and wedge against eccentric arm. Bring all stop screws against top comb arms and test with strips of paper. Turn timing dial to No. 5 and set eccentric so that paper will just draw through stop screws.

Rule 11. Turn timing dial to No. 4½ and have pin just entering star wheel so that feed rolls will just start.

Rule 12. Turn timing dial to No. 6 and then turn detaching roller cam around until steel detaching roller starts to turn forward at No. 6.

Rule 13. Set brass top rolls to leather detaching roll with No. 21 gauge, and have flutes of brass roll in mesh with flutes of steel detaching roller.



GEARING OF HEILMANN COMBER.

Draft. The draft of the comber is about 26, and can be got in the usual manner, taking it through from the feed rolls to coiler calender rolls.

The accompanying illustration shows the gearing of a comber.

Production for 6 Head Machine per day of 10 hours, with ordinary draft 25, and set for 15 per cent. waste.

Nips per Minute.	Grains per Yard in Lap.										
	200 lbs.	210 lbs.	220 lbs.	230 lbs.	240 lbs.	250 lbs.	260 lbs.	270 lbs.	280 lbs.	290 lbs	300 lbs.
75	39.87	41.85	43.85	45.85	47.84	49.80	51.83	53.82	55.84	57.82	59.80
80	42.50	44.66	46.75	48.90	51.00	53.15	55.26	57.40	59.50	61.70	63.80
85	45.15	47.45	49.70	52.00	54.20	56.50	58.75	61.00	63.25	65.50	67.80
90	47.85	50.25	52.60	55.00	57.41	59.80	62.20	64.50	67.00	69.38	71.75
95	50.52	53.00	55.50	58.00	60.60	63.10	65.65	68.15	70.70	73.25	75.75
100	53.15	55.80	58.45	61.10	63.75	66.45	69.10	71.75	74.40	77.00	79.75

The production in pounds per day may be found in the following manner.

Nips per minute × 1.35 revolutions of front roll to 1 of cylinder × circumference of front roll × weight of lap less per cent. of waste × number of laps × time run, divided by 36 inches × 7000 × draft = production.

COMBER.

Supplying Looms with Weft, Automatically.

The most conspicuous improvement, of late years, in the process of weaving is that of automatically supplying weft to the loom in the act of weaving. We do not know of but one invention of this kind that has proved itself successful in the mill under ordinary conditions, and this one is that belonging to the Northrop loom. There have been, and are, a number of other devices for supplying looms automatically with weft, but they have not yet established for themselves a permanent place in mill work. Most of the attempts for supplying weft in this way have been of American origin.

In illustrating and describing weft supplying devices of European invention, we do so without passing an opinion as to their practicability, a matter that we are certainly incapable of doing, as we have seen none of them in operation nor heard of their being introduced into mills to any extent, enough to assure for them anything approaching success. We refer to this mostly as showing what is being done abroad, and because of the interest that manufacturers are taking in automatic mechanism and improvements in the processes of weaving, which have engaged the attention of inventors of late more than anything else connected with the mechanical operations of textile manufacturing. It would not be safe to say that the automatic loom has reached a state of perfection, but it certainly has attained a position of practicability, subject to improvements.

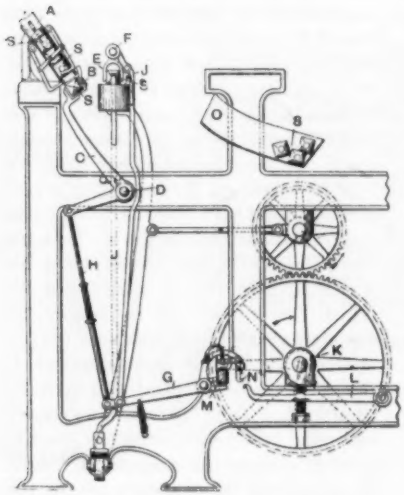
In Figs. 1 and 2, we show a new type of a European loom for supplying weft automatically, known as the Baker-Kip loom, which is constructed something on the lines of the old Continental idea, which was tried for box purposes, to obviate the use of a heavy circular or drop box on the end of the lay. In this case, the idea is used for supplying shuttles to the loom, as required, being rendered automatic by electrical control. The two ends are given in Figs. 1 and 2, the former showing the parts under normal conditions, while the latter gives them a position taken when the shuttles are being changed.

According to one of our foreign exchanges, the shuttle magazine A is fixed on the breast beam, having connection at its lower end with the placer B when the latter is in its normal position. This placer is carried on a supporting arm C which is pivoted at D on the loom frame. The movable shuttle-box E is suspended from the spindle F, which rocks in brackets fixed on the lay. The placer B is operated by a lever G, which also operates the shuttle-box E at the same time, the connection to the placer being through the connecting rod H, whilst the shuttle-box is worked by the connecting rod J. The lever G is operated by means of the tappet K (fixed on the low shaft) through its treadle L. This operation, however, can only take place when an electric current excites the magnet M, which by attracting its armature places the nosed end of the lever N in the path of the treadle lever L. When a full weft supply is obtainable, this treadle lever makes its movements without effecting a connection.

Under ordinary working conditions the position of the loom is as shown in Fig. 1, one shuttle S being in the shuttle-box, another in the placer, and others in the shuttle magazine. The lay recedes to the picking point, when the shuttle in the box E is picked to the opposite side of the loom; it then beats up and again recedes, and the shuttle—which we will presume is now exhausted of weft—is picked across and re-enters the shuttle-box E. This entry closes the controlling electric circuit, the magnet M is excited and attracts its armature, thus putting the hooked end of N into the path of the end of the treadle lever L. The tappet K should be accurately set so as to allow the treadle lever to remain up until just ready to engage with the hook on N, then as the treadle lever descends, lever G is pressed down at one end, rising at the other

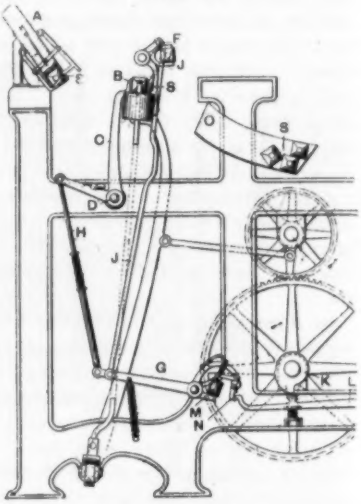
and lifting the connecting rods H and J. This is done while the lay is advancing to the beating-up point, as shown in Fig. 2, the placer B being moved forward to meet the lay, and the shuttle-box E swung round out of

FIG. 1.



and at this juncture the shuttle in the placer is picked across the shed. As soon as the picking stick has withdrawn, and the tappet has also completed its lift, the lever G falls free by means of its retracting spring, and

FIG. 2.



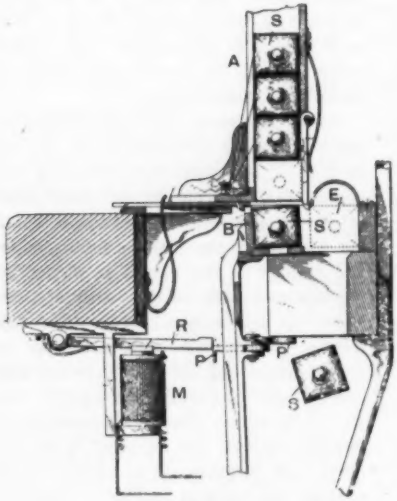


FIG. 3.

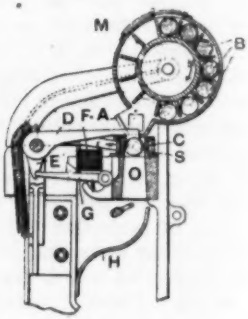


FIG. 4.

the way, discharging the exhausted shuttle while so doing into the tray O. The placer reaches and occupies the position ordinarily occupied by the shuttle-box on the lay by the time the lay has receded to the picking point, the connecting rods H and J which it operates allow the placer and the shuttle-box to return to their original positions, the latter having a flat spring to retain it in its exact place.

We show another method of supply-

ing weft, automatically, to the loom, in Fig. 3. This is also a European invention, the same as the previous one, and is simpler in construction, but regarded as not so readily adjusted. The shuttles are arranged in a magazine A above the placer B as before, but the shuttle-box E, instead of being of the rocking type, is provided with a false bottom for the expulsion of the exhausted shuttle. Instead of a tappet being employed for working the placer and shuttle-box, a projection P is fixed under the lay riding backwards and forwards with it, which passes or catches the lever R according to the state of the magnet.

Another alleged European invention (Fig. 4), but which appears as a close imitation of an American one, seems to go a step forward as regards automatic arrangements, by refilling the shuttle itself and feeding bobbins to the magazine, which discharges one bobbin at a time into a receiver placed directly over the shuttle, or rather over the shuttle when it is in the shuttle-box. A vibrating knocker actuated by the movements of the lay drives the full bobbin from the receiver into the shuttle, displacing the empty bobbin and then being held by specially-contrived springs until it, in its turn, requires replacing. The magazine M is made in either a circular form, as shown in Fig. 4, or of a vertical form. In the former case it consists of a drum fixed on a spindle which revolves as required in bearings attached to the loom frame. The magazine is provided with a number of cells or pockets to receive the full bobbins B, which are kept in place by an outer casing which encloses the sides of the magazine. The bobbins fit loosely in their pockets until each in turn is brought over the lower opening in the magazine, when it falls out into a receiver A, under which the shuttle-box C comes when the lay beats-up.

The receiver is really of the nature of a hopper, open at both top and bottom and provided with plate springs sufficiently strong to hold the bobbin from falling out by its own weight on the vibration of the loom. Under ordinary working conditions a bobbin is in the receiver. A vibrating knocker D, is mounted on the breast beam, whose head is normally situated just above the bobbin in the receiver. This knocker is provided with a pendant arm E and a suitable spring for returning it after a movement. An electromagnet F is mounted on a bracket attached to the lay, as is also a hinged projecting finger G which carries the armature of the electromagnet. Normally the finger G rests on a slightly-hooked support which prevents its being drawn below the required level by the retaining spring which is attached to this hooked support. The shuttle is open at both top and bottom, and there is also an opening O in the lay through which the empty bobbin is pushed by the entrance of the full one from above. The empty bobbins fall into and accumulate in the receptacle H which is provided for the purpose. These movements are shown in the act of taking place in Fig. 4. The bobbins and shuttles for this loom must necessarily be of special construction.

Finishing Cotton Fabrics.

There has been devised a new method of fixing the finish on cotton piece goods of the class known as Italians, such as are generally used for the lining of coats. The process has for its object the finishing of such goods in a manner so that the lustre will be more uniform and brilliant, with a silk-like appearance. The cotton fabrics are, in the first instance, finished as hitherto, in any of the well known ways of pressing, calendering or embossing, but, as is well known, the finish so produced is not permanent, as the lustre is damaged or destroyed when the fabric is by any means damped, or in the making up of the garments.

In order that the lustre produced by any of the ordinary methods may be permanently fixed and of uniform

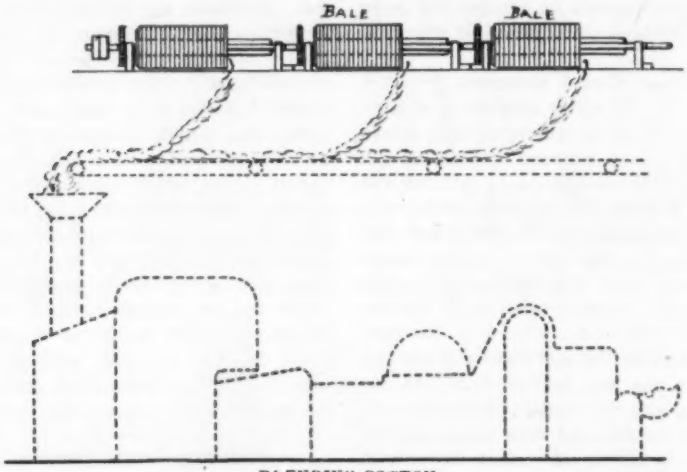
brilliancy, free from spots throughout the entire length and breadth of the fabric, the latter is damped uniformly, preferably by subjecting the fabric to steam at a low temperature—that is to say, by what is known as "wet" or "saturated" steam. This, it has been found, can be conveniently done during the time the fabric is passing through a stretching-machine of the ordinary construction, such as is used in one of the stages of finishing.

The folded fabric and damp press papers are afterwards placed between the plates of an ordinary hydraulic press, which are heated by steam, and the whole subjected to great pressure, after which they are taken out of the press, the damp press papers removed and the cotton fabric wrapped in a thick fold of dry cotton cloth, preferably in a condition it is in as it leaves the loom, known as "in the gray." The two are then placed into the steam-heated hydraulic press and subjected to heat and pressure for a period varying according to the thickness or weight and quality of the fabric on which the lustre is to be permanently fixed.

—Burmah does not import woolens largely, having a climate more suitable to cotton goods.

Scheme for Blending of Cotton.

There has been devised in England a scheme for unbaling and blending cotton, particularly applicable to the treatment of bales in which the cotton is pressed in coiled layers, such as the type of bale commonly known as the Lowry bale, in which the cotton lays in coherent coils disposed transversely to the axis of the bale. The underlying feature of the scheme consists in uncoiling the cotton in a reverse direction to that in which it was laid. This is accomplished by the rotation of the bale, and at the same time the cotton is taken from two or more bales onto a traveling sheet or other conveyer, which carries the cotton to a cotton-opener or other machine for subsequent treatment preparatory to spinning. By this process the twist possessed by the cotton if taken straight from such a bale is eliminated, and facilities are given for automatically blending the cotton direct from the bales, and thus obtaining a more uniform mixture.



BLENDING COTTON.

We have undertaken to give an idea of this scheme by the accompanying illustration. In this we show the use of a spindle, but where the form of the bale does not conveniently lend itself to the use of a spindle, other

arrangements will suggest themselves.

The bales having been stripped of their coverings, are deposited on plates. The top end of the cotton of each bale is lifted up and passes through its drawing-off rollers, and the plates are then turned in a direction opposite to that in which the cotton was originally coiled. The cotton from all the bales is conducted over guides onto a traveling lattice, creeper, or conveyer, and conveyed collectively to the feed-hopper of the machine for subsequent treatment.

Other methods may be used for rotating the bale, and the details of the conveyer may be varied almost indefinitely to suit the exigencies of any particular case. For example, the cotton from the rotating bales may be deposited in a conveyer adapted to carry the cotton upward to a higher part of the mill, whence it may descend through the various machines used in treating the cotton previous to spinning.

Labor Conditions in North Carolina.

At the hearing before the industrial commission at Charlotte, N. C., March 16, Labor Commissioner Lacy testified that in 210 factories in North Carolina there are 33,757 employees, 14,638 men, 15,811 women, 3308 children (1679 girls and 1629 boys). The comparison between the relative numbers in 1896 was significant and a healthy sign of a better condition of affairs. In 1896 there were in round numbers six thousand men, ten thousand women and 6800 children employed in the factories. Now without any law or unpleasant agitation the number of children employed has fallen to only 3308, a reduction of fifty per cent., while the men have increased over 100 per cent., and the women over fifty per cent. There had never been a strike in a cotton mill in the State, and there is almost no labor organization among mill workers. He favored compulsory education. Mill owners testified that the present conditions in the South are satisfactory.

Oldham Cotton Spinning Firms.

According to the "Cotton Spinners' and Manufacturers' Directory" of Oldham, Eng., 40 new firms for cotton spinning or weaving, or both, came into existence last year, and 15 firms ceased to exist, the net increase being, therefore, 27 firms. There was a net increase of 449,291 spindles and 9848 looms. The following table shows the approximate number of firms, spindles and looms engaged in the cotton industry of the districts in question during the last ten years:

	Firms.	Spindles.	Looms.
1891	1,793	42,401,701	610,934
1892	1,818	43,054,227	615,719
1893-94	1,777	42,970,528	602,627
1894-95	1,785	43,186 657	627,585
1896	1,771	42,681,081	638,469
1897	1,760	42,061,287	641,547
1898	1,735	41,795,731	629,942
1899	1,760	42,190,910	638,972
1900	1,787	42,640,201	648,820

It will be observed that while the present number of looms is the largest in the record, the number of spindles, though showing a continuous increase for three years past, is smaller than the total in any of the years from 1892 to 1896, inclusive.

Mercerizing.

A French patent has been issued for an invention permitting of mercerization without tension, for the purpose of obtaining a lustre on vegetable textile materials. The invention relates to an apparatus, or device, for use in the mercerization of textile fibres, and its primary object is to provide an unshrinkable backing cloth or fabric, which is adapted to take up the mercerizing liquid and then transmit the same to the fibres which are to be mercerized, the fibres and backing-cloth being adapted to be rolled up together upon a roller. The device appears to be a very simple one mechanically, judging from the illustrations that we have seen of it.

Dust Trunk for Cotton Openers.

We illustrate an arrangement for a dust trunk, or tube, for cotton openers, as the suggestion of an Englishman. As is well understood, this is for the purpose of carrying cotton to the opening machine from the mixing room, as an efficient method, and so constructed as to be easily cleaned.

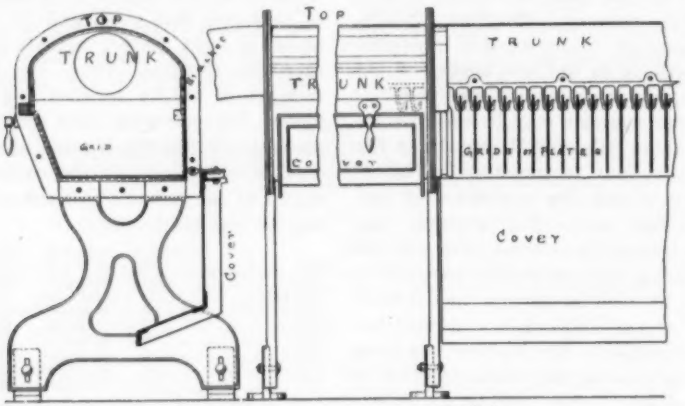


FIG 2. FIG.1.

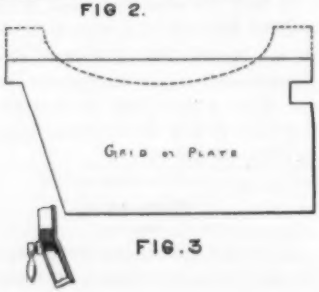


FIG.3

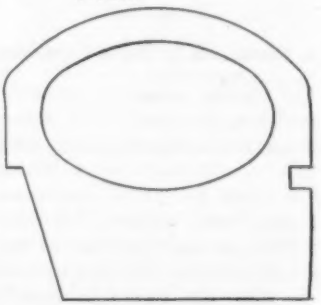


FIG.4.

FIG.5.

Figure 1 is a longitudinal elevation of a pneumatic dust trunk, partly opened and partly closed. Figure 2 is a transverse sectional elevation; Fig. 3 a side elevation of division plate, grid, or partition; Fig. 4 a side elevation of the modified form of division plate or grid; Fig. 5 a sectional detail showing fastening for lid, or cover.

The drawings will be readily understood by any practical cotton manufacturer. In the pneumatic tube or trunk the grids which catch or separate the dust are formed of a number of loose removable division plates or partitions, that can be readily moved or displaced to allow of the removal of any dirt or fibre that may have accumulated or stuck between them or in the tube.

To each side of the trunk are affixed brackets by bolts or otherwise, by which the division plates are held preferably suspended in position. The plates are preferably made of the contour shown in Figs. 2 and 3, with a notch cut at one side and a projection at the other to rest upon the supporting brackets, thus suspending the plates as on a pivot from a point a little below the top edge. This will allow of the bottom edges being moved to and fro or of a single plate being removed. The division plates may be otherwise supported each loosely and separately in any convenient manner.

The bottom and one side of the trunk are made or joined together to

form a "lid" or cover of angular shape, as shown in Fig. 2, or curved, so as to cover both the bottom and one side of the trunk. This lid is hinged or pivoted at the back of the trunk on a pin and opens clear of the division plates. When the lid is opened, the bottom and one side of the partition plates are exposed, which allows the loose dirt to fall away and renders the plates easily accessible both in front and beneath for the removal of any dirt or dust adhering thereto. The lid may be hinged in the centre to open straight, if desired. The top may also be hinged, so as to give access to the top of the grid, when desired.

The division plates may be flat on top, or they may be recessed to the extent of half a circle, as shown in dotted lines, Fig. 3, or corrugated or otherwise formed to give a greater rubbing surface to the fibres passing over them, or they may be stamped out with a hole or passage of circular or other shape through them to give a rubbing surface both at the top and bottom. (See Fig. 4.)

Cotton Crop in India.

Information has been obtained through the State Department, Washington, D. C., that the Director General of Statistics to the government of India, has issued a memorandum of the Indian cotton crop for the season of 1899-'00, from which it appears that the season has been disastrous to the crop in all sections.

In the beginning of the season the rain fell in some tracts in such quantity as to interfere with sowings, while in others there was not enough to permit of sowings being freely made. There followed throughout the country an interruption in the rain, and the young plants withered and died under the drought and heat. In central and western India, especially Berar, the Nizam's territory, Rajputana, the Central States, and Bombay, the effects of the season have made themselves felt in the worst and most aggravated form. In many places, there is no cotton to pick; and, on the whole, perhaps not a fifth of an average crop will be obtained. In northern India conditions are not so bad, but they leave very much to be desired. For the whole of India it may be said that the area and yield compare with those of 1898.

Early English Manufactures.

The first influx of Netherland population was into the East Anglian counties of Norfolk and Suffolk. In the reign of Henry V. the cloth industries were mainly centred in Norfolk, whose capital, Norwich, then ranked as the second city in the kingdom. Another Norfolk town, Worsted, has fallen into oblivion in spite of its splendid Gothic church, but the name of the thread first made there is known to all the world. From East Anglia the making of cloth gradually extended southwestward to Winchester and Salisbury and northwestward into Cheshire, until by the time of James I. the share of the West in it had begun to predominate. To go back to Henry V., the company of Merchant Adventurers, devoted exclusively to the exportation of manufactured woolens, was chartered in 1407; for three centuries it was a body of much importance, and after its type were constructed some of the greatest of modern mercantile companies. Thus the Flemish influence upon mediaeval England was commercially of great significance. But there was much more in it than spinning and weaving. One cannot long study the period of the Reformation, say from Henry VIII. to Oliver Cromwell, without observing that the eastern counties were the stronghold of democratic ideas and of Puritanism.—Fiske.

—Buyers who visit Constantinople are constantly asking for lower prices, and now complain seriously of the Austrian competition.

—The fat acids, such as oleic acid, have like other acids the property of forming salts with metallic oxides.

WOOLEN DEPARTMENT.

Worsted and Woolen Manufacture.

FRED BRADBURY.

(Continued from March.)

A photograph of a second type of vesting cloth is given at Fig. 7. A general examination of this illustration readily reveals to anyone possessed of ordinary knowledge and experience of woven fabrics, that the surface of the cloth is composed of a small fancy weave effect with small rectangular figures arranged in simple drop reverse order introduced. Equidistant between these spots are other smaller spots, but they are not visible in the illustration on account of their color, being red, which in a photograph appears black and consequently looks the same shade as the ground of the texture, which is black. The upper part of the photograph shows a portion of the back of the cloth, the full details of which will be brought out in the explanations and description which follow; suffice it to say at this juncture that this woven fabric is undoubtedly one of the best types of woven structures for vestings, and for figuring such cloths economically, yet conceived.

The fabric is double in structure and is made to the particulars as given below:—

1. Face warp, 2/48s black botany.
2. Back warp, 2/48s black cotton.
3. Extra silk warp, 24/2 spun silk.
4. Face weft, 2/44s black botany.
5. Back weft, 2/48s black cotton.

In light green and red colorings.

The introduction of the silk warp substitutes the cotton warp at the back of the cloth as well as serves the purpose of an extra warp on the surface of the texture. The warps are dressed on two beams, all the Botany being on one and the cotton with the extra silk warp upon the other, and this latter is dressed as follows:—

1 thread black cotton.
2 threads red silk.
7 threads black cotton.
3 threads green silk.
2 threads red silk.
3 threads green silk.
6 threads black cotton.

24 threads in one repeat of the back warp.

Note.—There are two repeats of this pattern to each repeat of the face weave. The warp threads are subsequently drafted through the mails of the heald shafts, one thread of face to one thread of back, the weave design being made to correspond.

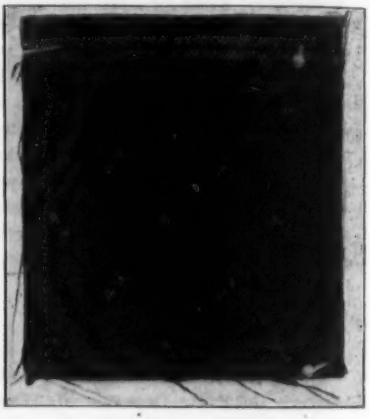


FIG. 7. FACE AND BACK.

Set of warp in loom, 112 threads per inch. Width in reed, 62 inches. Picks per inch of weft, 96. Woven pick and pick, face and back. Weight per yard, finished, 16 to 17 ounces for 56 inches.

The face and back designs are supplied separately at Figs. 8 and 9 respectively. The former is a small fancy weave of which one repeat is complete upon eight ends and picks, while the latter is plain, which, though a finer weave than that of the face, is made with its finer warp and weft to balance the structure of the face cloth.

At Fig. 10 one complete repeat of the figure effect is shown, together with its respective and relative positions to the face design. The dotted squares of this design represent the

face warp raised; the solid black squares indicate the position of the light green silk warp upon the face of the cloth, and the squares with a circle in them show the position of the red warp when it appears upon the surface of the texture. To the back of this weave and cloth is stitched the plain texture given at Fig. 9.

A section of the design at Fig. 10 marked AA and bracketed is fully developed at Fig. 11. In this compound sectional design the position of the different colored threads and of face and back threads are indicated above, where the blank division represents the face threads, wool; the dash, or diagonal, lines, represent the back cotton threads; the solid black lines represent the green silk warp, and the "o" lines, the red silk. At the right hand side of the design the face and back wefts are indicated by the white and black horizontal lines respectively. The following is a detailed explanation of this compound weave:—The dotted squares show the face weave (upon the odd ends and picks) which, it should be observed, coincides with the portions of design marked AA at Fig. 10. The diagonal dashes to the right (A) represent the backing weave, Fig. 9, placed upon the even ends and picks; the diagonal dashes to the left (B) show how all the face threads are lifted where the back weft is inserted and thus permitted to interlace only with its own set of warp threads; the solid black squares show how the extra green silk warp which has replaced its corresponding backing thread, is brought on the surface of

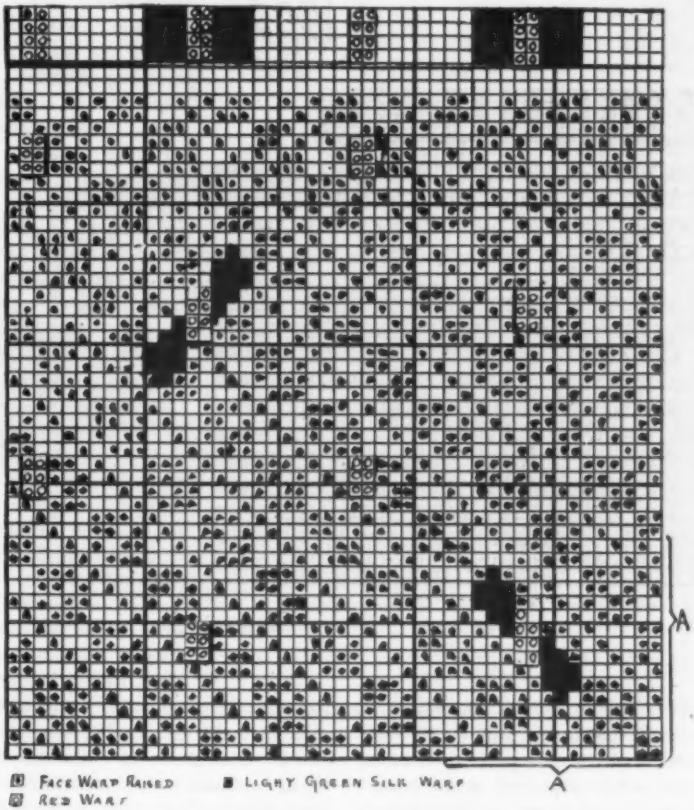


FIG. 10.

the texture; similarly the squares with circles show how the extra red silk warp is brought upon the face of the fabric, while at these places the Botany face warp is taken to the back of the cloth and weaves plain with the cotton weft instead of the silk,

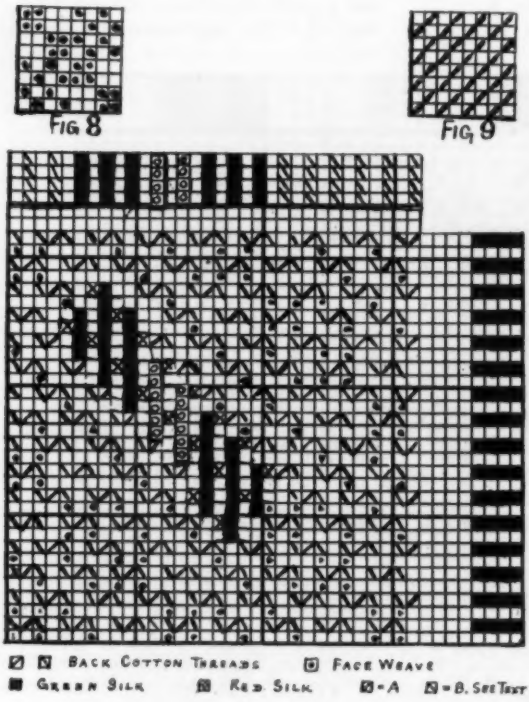


FIG. 11.

which is shown by the squares with crosses in the design and which may also be seen in the portion of cloth (turned over) at the top of the photographic illustration supplied at Fig. 7.

A further and important illustration is supplied at Fig. 12, which shows a cross section through the weft. The dots represent the face weft; the crosses the back weft; the solid interlaced black line shows the face warp, while one of the silk warp threads which takes the place of one of the backing cotton warp threads is represented by the dotted intersecting line. This diagram clearly demonstrates the weave or interlacing structure of the fabric under consideration. Here it should be carefully observed that the face warp interlaces with its own weft just the same as is given at the point paper design, Fig. 8, excepting at those places where it passes to the back, when it weaves plain, as shown in the illustration (Fig. 12). The silk warp weaves plain at the back of the cloth, but floats over the face weft and back cloth where it is required to produce a spot or small figure effect upon the face. Note that at this place the face wool weft is entirely above the backing cloth, though under the figuring warp, and thus it lies at right angles to the extra silk warp and so the latter is made to stand upon the surface of the woven structure to the best possible and visible advantage.

In conclusion, let anyone who is at

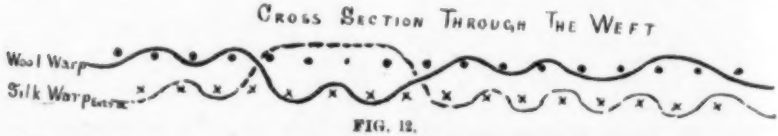


FIG. 12.

The development of the complete design is simply an extension of the portion already given and therefore it is not necessary to take up time and space by extending the same here.

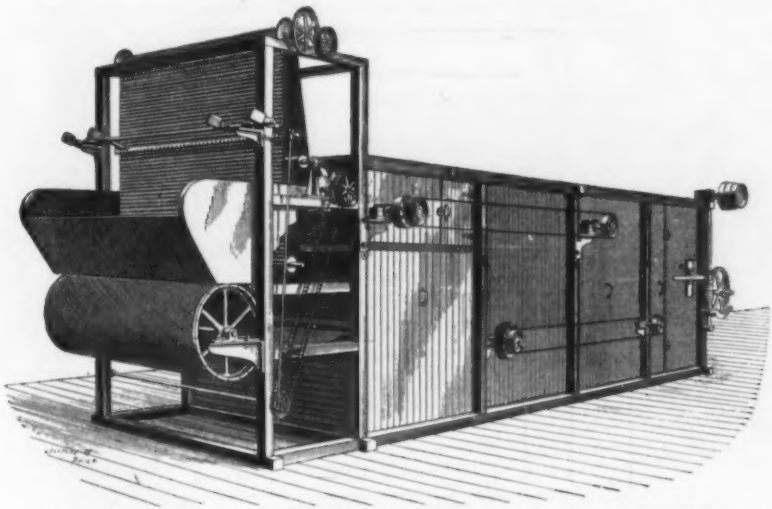
all interested in this kind of manufacture carefully peruse the foregoing matter and I venture to assert that he will find such woven structures not only excellent and salable, but pregnant with suggestive material.

Modern Wool Drying.

Until the past few years a wool drying machine of any considerable capacity that was economical in labor, floor space and heat necessary to operate it was an unknown quantity, and, until the advent of the automatic continuous machine, advantageous drying was one of the principal difficulties experienced by woolen manufacturers.

After a great amount of tedious and expensive experimenting, the Philadelphia Textile Machinery Company, Hancock and Somerset Streets, Philadelphia, Pa., produced their now famous "Cyclone" Automatic continuous machine for drying or carbonizing wool stock, noils, etc., which marked the beginning of a decided advancement in this branch of the industry, and with the improvements added from time to time the machine they now offer is certainly well worthy of consideration. Under all the old systems it was imperative that a uniformly low temperature be maintained in order to prevent harshness in the fibre (one of the chief features in successful wool drying), consequently the capacity was comparatively small and the expense of drying great. Sometimes, however, in order to meet the requirements of a larger capacity, a high temperature was used, greatly to the detriment of the fibre.

As a result of their experiments, the Philadelphia Textile Machinery Company found that harshness was produced by two causes, i. e., a high temperature on dry stock and a lack of air circulation, or, in other words, a baking of the stock. They also learned that by subjecting the stock to a high temperature (say 180 degrees upon entering the dryer), and gradually reducing it by means of their successive compartment system until it emerged from the machine at the comparatively low temperature of 110 degrees, that the result obtained was in reality the same as by cold air drying. The grading of heat in the successive chambers produces a soft fibre, free from harshness when dry, which is due to the fact that on entering the dryer the stock contains its maximum amount of moisture, which effectually counteracts the bad effects of the high temperature to which it is subjected. The actual temperature of the stock at this stage of the drying is, however, much less than that of the air in the enclosing chamber. The

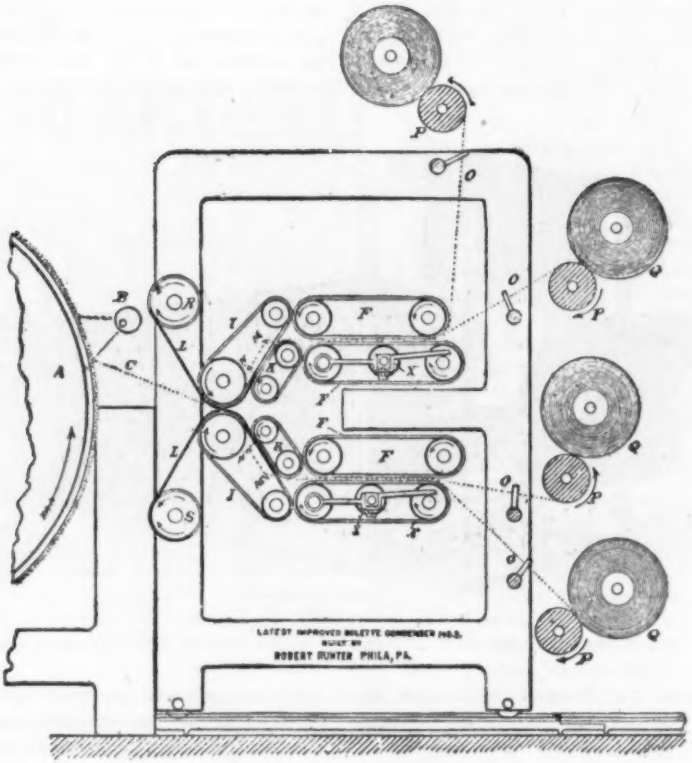


"CYCLONE" ONE SECTION AUTOMATIC WOOL DRYER, WITH SELF FEED.

greatest amount of moisture is of course evaporated in the first compartment, and as the stock passes on through the successive chambers, the temperature is reduced to correspond with the amount of moisture still remaining, until the wool finally emerges from the dryer soft and lofty, as well as dry.

The Improved Bolette Condenser.

The accompanying illustrations show a sectional and a perspective view of an improved Bolette condenser for wool, embodying the result of long practical experience with this system of condensing the roving. The functions of condensers on the



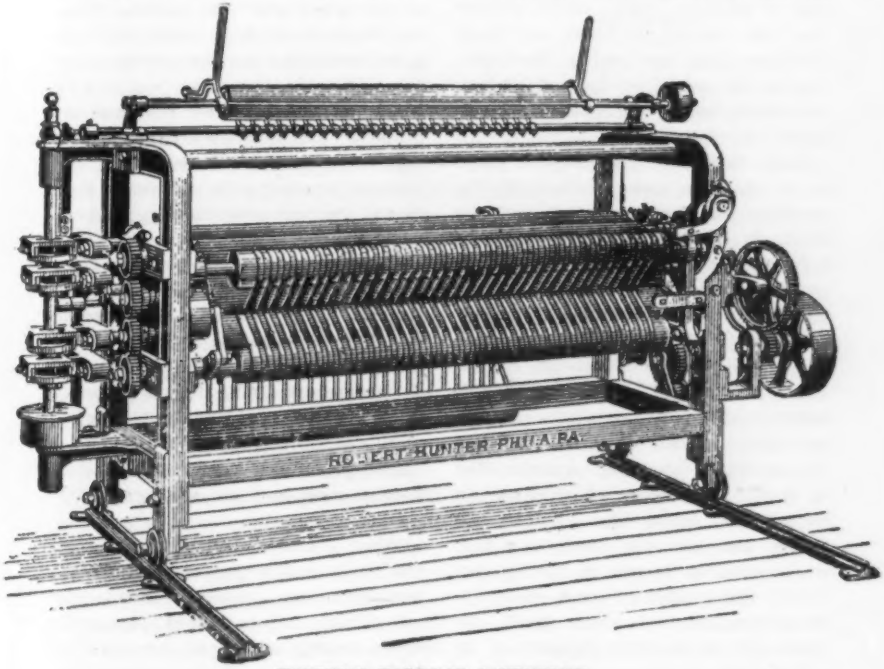
HUNTER S BOLETTE CONDENSER.

The machines range in capacity from 2000 lbs. to 15,000 lbs. per day, and are built of such sizes and dimensions as to fit any space at the disposal of the manufacturer for such a machine. The saving in floor space for an equal capacity over the old methods is enormous, and the cost of labor and heat is reduced to the minimum.

finisher card do not seem to be fully understood, in the claims that are occasionally made for them, of increasing the production of the carding machine. Condensers have nothing to do with the quantity and quality of the carding process, but have for their object simply the taking of the carded material from the last carding process in a form that can be properly uti-

lized for spinning. They are intermediate machines between the process of carding and spinning, and are no more than a mode of doffing.

There are four methods of condensing, which may be classed under the following heads: (1) single doffer and double stripper machine; (2) single doffer and single stripper machine; (3) double doffer and double stripper machine; (4) fillet doffer lap machines with grooved metal dividing cylinders and tapes, represented in the Bolette machines. All of these four methods are known in European practice. The first two are almost exclusively confined to European mills, while the latter two are known to American mills. The third system has been in very general use in our mills, but it possesses features that are more or less objectionable, and need simply to be mentioned to be recognized, in the fact that the upper doffer being the first to receive the wool from the card has, in a sense, the first selection of the wool that is delivered, and is apt to rob a large portion of the stock that should be delivered to the lower doffer, often making it necessary to keep the roving from the upper doffer separate from that of the lower doffer in the process of spinning. The principle of the single doffer, as exemplified in the Bolette machine, is undoubtedly the better for a large portion of the work in our mills, as insuring more perfect work, besides being the simpler. The method of condensing by the Bolette system is growing in popularity among our manufacturers, as possessing valuable features that cannot be obtained by any other system.



HUNTER'S BOLETTE CONDENSER.

The improved Bolette condenser shown here embodies a number of improvements, which have been suggested in practice. This machine is strong, and can be readily handled; is free from complicated parts, and guaranteed by the maker to be perfect in mechanical construction, and made to absolute standard sizes.

The manufacturer of the machine is Robert Hunter, 1525 Clearfield St., Philadelphia.

Effect of Finishing Processes Upon Colors.

Some finishing processes have little or no effect upon the colors of a fabric, and those which have may be classed as fulling, washing and sponging. It is very evident that the alkali as well as the soda contained in soap will have a strong influence on colors during the fulling process, unless the dyes are prepared from materials which are fast to milling. Colors which are not fast lose shade and bleed, and such bleeding may act as a hindrance where the detached dyestuff decomposes the soap, and insoluble color lakes are formed.

Many colors are in this manner altered in shade or tone, particularly the wood stuffs, if they are not skilfully dyed. If, for instance, wood blue from logwood, alum, tartar and bluestone is dyed too acid, it becomes in fulling completely dead and dull. Even perfectly fast fulling colors are altered in their tone by the alkali—as, for instance, cochineal. Another trouble arises if light colors or whites are fulled together with dark colors, when the so-called "smutting" occurs—that is, small quantities of dyestuff fix themselves upon the light-colored yarns, and even the dyestuffs which are considered fastest to fulling give rise to this trouble. In such cases it is recommendable to either hang the goods in the sulphur chamber or to treat them with aqueous sulphurous acid; sometimes a mere acidification with sulphuric acid answers the purpose. A good plan also is to wash the pieces in a bath of permanganate of potash (so much permanganate that the bath is colored rose) for about half an hour, rinse in clear water, and run them through a bath of sulphurous acid to which very little blue is added; if the white should still be dirty, wash with fuller's earth.

Different colors have a different influence upon the fulling capacity of the goods, and dyed wool is more difficult to full than undyed wool. It can even be asserted that the longer protracted the dyeing process has been, the more has the wool lost its felting property. The dyeing of ordinary acid dyestuffs requires one hour; with wood dyestuffs, after the one-bath method, two to two and a half hours; with mordant dyestuffs, inclusive of the mordanting boil, three to five hours. The differences in the fulling capacity of these colors are therefore easy to comprehend; but even within the limits of the same dyeing method many differences are noted. Thus, for instance, the blue colors full with more difficulty than the greenish, etc. Most differences, however, occur with black. Chromium black possesses the property that the wool dyed with it behaves very well in spinning, and shows a strength which is greater than that of the raw wool; these goods, however, are more difficult to full than such as have been dyed black by other dyeing processes. With sumac black the case is the reverse: the spinning property is decreased and the felting capacity increased. The behavior of chromium and tannin dyes is generally analogous. The colors dyed upon an alum mordant behave, although to a less degree, like the chromium mordanted ones, and are somewhat difficult in fulling.

What is true of fulling applies also, though to a less extent, to washing; but here, too, special cases occur which may be considered. Ammonia is frequently employed for washing the soap out of the fulled material, because soap and time are saved by such process. Ammonia has the property of acting upon some dyestuffs, giving them a bluish tone—as, for instance, in the case of archil and cochineal; several artificial green dyestuffs are dulled by ammonia, the blues becoming darker, the violets lighter, etc. This behavior must be taken into consideration, and alteration of color, if it takes place, must be corrected by washing with a little acid. A great inconvenience, which is peculiar to the washing department, is the smutting off of the color. The material may run for hours upon the washing machine.

and the waste water flow off perfectly clear, and yet additional color comes out on strongly squeezing it in the hand; in many cases the water is all the time clear, and the defect shows only after drying. The cause varies: either the defect is attributable to the fulling, or its cause may be found in the preceding stages of the manufacturing process or in the dyehouse.

If calcareous water is used, it should always be corrected, because the "smutting off" may be caused by the formation of insoluble lime soaps (settling back of the dirt in washing). If the raw material used belongs to wools which have been washed in summer, it still contains much of the natural grease which it has not been possible to completely remove in washing or fulling. Or the wool may, during spinning, have been dressed with cheap unsaponifiable oils. The fuller must bring all his skill to bear on such goods; but in most cases, although pure white and colorless, they do not emerge from the fulling mill perfectly clean. If they are then carbonized the grease penetrates still deeper into the fibre, and is no longer removable by the subsequent dyeing and washing. Under such conditions the goods must smut off and feel greasy when dry, but it would be unjust to blame the dyer. When such a piece is extracted with alcohol and ether, the grease is determinable as dissolved in the latter. But the case is very different if the dyer has actually blundered in dyeing; in that case the material has not a sticky, but rather a dry feel, and no grease can be determined in it with ether. However that may be, the following procedure usually corrects the trouble. In the case of white material, the soap dirt, after fulling, is rinsed off upon the washing machine, which requires one-half to three-quarters of an hour; then the cocks of the supply and waste pipes are shut, and the material is run for half an hour in dilute sulphuric acid, the proper degree of concentration being 3° Tw. The soap acid is precipitated in a finely distributed insoluble form on the material, and can be easily removed, especially upon the broad washing machine. The material is then easily dyed, and does not smut off in the least. In cases of black or colored goods which show this defect, the same treatment is applied, provided the colors allow it. In both cases the acid bath is followed by one-half to two hours' rinsing in pure water.—Farber Zeitung.

Style Suggestions for Woolen Manufacturers.

The conditions which prevail are more favorable to an early opening of light-weight lines than to a late one; this is due to the fact that many mills were disappointed on their heavy-weight suiting orders, and finding it difficult to fill in on heavy-weights on special lines, will endeavor to make the light-weight opening as early as possible, and thus make the period to be tided over of the shortest duration possible.

The mills which have been left on fancy business are many, and are of two classes; first, those who had the orders and had them cancelled, and second, those who secured few orders. Of these two classes the latter is undoubtedly in the better position, for not having secured enough orders, these manufacturers endeavored to find something which would fill in, while the mills which secured many orders found after these were cancelled that the unfortunate manufacturer had covered the market later, and was in the stronger position.

The many inflated values in the suiting market has made the buyers wary, for the amount of reductions made has caused them to look with distrust on all values and wait for reductions even on staple lines where there is no chance of one.

The action of the Gilbert Manufacturing Company in reducing all their heavy-weight lines 12½ cents a yard, of J. B. Lorge in reducing two worsted lines 20 cents a yard, and the same policy being pursued by the Pontoosuc and many other mills, have

been the causes of this demoralization.

These conditions are what will bring about an early light-weight season, and, too, many manufacturers were late in opening on heavy-weights, and will not be caught napping on light-weights.

After this decision is reached, the next thing is to find fabrics which will be in demand, and the colorings which will be wanted in them.

A year ago the demand was just commencing for Oxfords, for suitings and overcoatings, and the large volume of this business was done on practically two mixes, a light and a dark one, in heavy-weights; the same colorings were in demand, and a blue-gray was added. It is too early as yet to forecast the exact demand for this fabric in light-weights, but the consensus of opinion is, that it will sell, but should be made in small checks and plaids, and with the addition of green slate mixes and real slate mixes and olive mixes.

A line of this character was made in heavy-weights by the Worcester Woolen Mill Co., in "all-wool" goods, for $1.05, but the criticism is made that the patterns are not fancy enough, being entirely too staple. It is absolutely necessary in light-weights that these colorings be bright and attractive.

There is a large and growing demand for worsted cheviots, and it will continue during the coming light-weight season. In heavy-weights, two mills are entirely sold up on this fabric, and the call for it is sure to continue in light-weights, for worsteds and cassimeres being so high in price and Oxfords necessarily on the wane after the run of the present heavy-weight season, the buyer will want a fabric which will be serviceable, cheap and sightly, and the cheap worsted cheviot combines all these qualities, and here, as in the Oxfords, the green slate, slate and light and dark olive mixtures will predominate.

In cassimeres the lines from $1.00 to $1.25 will be the sellers, and the best all-wool cassimeres near the lowest price, will have the call; the Indian Springs will probably be about $1.10 and this is one of the best lines on the market in light-weights. In all cassimere lines, as in the Oxford and worsted cheviot fabrics, the olive, slate and greenish gray combinations will be in greatest demand, and the pattern must be attractive.

All worsted fabrics are high in price, and the large volume of business will be done on the cheaper fabrics, the worsted warp and cotton filled goods will be used chiefly in trouserings and in these lines the old filling roll patterns are coming back, as in the cheaper grades of worsteds the doeskin face patterns are coming into vogue. In the cotton worsteds and all worsted fabrics, the slates and grays and olives will be called for.

One fabric which is always in demand is the covert and in these the stone grays will be the coming shades.

—In almost all European countries the importation of indigo was at one time or other prohibited, even in England during the reign of Queen Elizabeth.

—It has been proved that blue ribbons found on Egyptian mummies 5000 years old had been dyed with indigo, such mummies now being preserved in several museums—for instance, in Vienna, Glasgow, etc.

—The Greeks and Romans do not appear to have employed indigo in dyeing or printing at all, but merely for painting or staining purposes.

—The celebrated blue garments of Sidon, the sister town of Tyre, where the ancient purple mentioned in the Bible came from, were also found to be indigo dyed.

—Such an important dyestuff as indigo could not help but attract the attention of the chemical industry, so much developing during the last few decades, and a great number of chemists, in all positions in life, endeavored to make indigo artificially.

KNITTING DEPARTMENT.

The Knit Goods Situation.

Hosiery and underwear are quieter than for several months. The lull is rather welcome to the trade at large, in view of the brisk business since midsummer. More or less unseasonable weather has had something to do with slackening demands, but the yarn market is a greater check. Yarn promises to be a leading factor in prices for a long period to come. Advances must be made, but they will be stubbornly contested, particularly at the outset. The upward movement once begun will thereafter move easier.

Although woolen and worsted yarns are quieter than for some time, spinners have enough orders to steady prices. Cotton yarns generally are decidedly strong. In fact, several spinners have refused to consider orders where they did not have the yarns in stock. Others are taking orders subject to four months' delay in delivery. Should the strong upward movement in cotton continue much longer, they are sure to impose unusually arbitrary conditions. As prices stand, knitters are forced to buy with great deliberation. Should prices on knit goods become better, with greater alacrity than expected, the sudden demands of knitters, added to the liberal call of weavers, who are less handicapped, would undoubtedly give spinners another opportunity to stiffen their quotations. The sellers are now regulating the volume of business, for the reactions in cotton are recovered with surprising ease and promptness.

Imports of staple hosiery are still behind requirements with little prospect of catching up. The customs authorities, by advancing certain lines on apparently slight grounds, have helped to increase the scarcity.

Golf goods are likely to take care of themselves, that is, the crowd of golf manufacturers has been heroically weeded out and signs of recovery are already manifest. Cotton is being introduced therein in place of woolen golf goods with a good deal of success. The shrinkage of woolens has always been troublesome.

Imitation mercerized goods evidently cannot begin to give as much satisfaction as lisle thread goods, while the genuine mercerized hosiery is unduly high.

Fancies are being generally taken, but in small assortments. The feeling clearly is that the demand may change with a sharpness that makes small stocks imperative.

Importers would like to make a general advance in figures, but hesitate, knowing that it would occasion temporary loss of trade. They prefer to sell at present prices and risk replacing on reactions from the maximum advance of 30 odd per cent. The advance, however, is in a large measure permanent.

The two and three thread goods, double soled and high spliced seem to be gaining a foothold.

The acme of absurdity has been reached by one manufacturer, who attempted to first fill later orders from the same house, simply because they were taken at higher prices. Of course the scheme got no further than the attempt. Even the knit goods trade has its opera bouffe.

The appraisers persist in advancing arriving hosiery that was ordered last summer and will continue to do so until a thoroughly organized protest is made. Buyers are at fault for they content themselves with desultory complaining, instead of furnishing proofs. The only great difficulty is that there is no legitimate quotation on Chemnitz goods for immediate delivery.

There has been just enough cold weather within a month to check spring business in underwear, although in the end nothing is likely to

be lost thereby. Buyers were expected in unusual numbers, but were below the average number, occasioning great disappointment in many quarters, although several firms report a satisfactory volume of business with exceptionally judicious selections.

Speculation is rife as to the filling of orders for cotton fleeces and mixed wool and cotton underwear, taken several months since, at shockingly low figures. Nearly every contract filled will be at a decided loss, although plenty of buyers would gladly take the goods at a profit.

Combination suits seem to be steadily gaining in popularity, just why it is hard to say, although some of them are capital productions in their way.

Sweater specialties are doing better than for a year or two past. In this line a handsome traffic is being developed in manufacturing to order for athletic clubs. Most varied combinations of colors are now obtainable therein.

Cellular texture goods are being turned out in cotton and lisle goods for the hygienic trade, and a large demand seems likely to result. Ventilation is the object of the cells and at the same time sufficient air is secured about the body for thorough protection. Worsted gauze goods appear to be coming to the front. The spring wear exhibit includes more light weight flat goods in wool than have been seen for a long period, if not, indeed in the history of the trade.

The Advantages to a Hosiery Mill of Dyeing Its Own Goods.

One of the principal advantages to a hosiery mill doing its own dyeing, is the saving in time. It takes from one to two weeks to get goods back to a mill sending them out, the length of time depending upon distance from dye house and freight facilities, whereas a mill doing its own dyeing can have its product going along through the mill without a hitch and can manage much better than if it had from 500 to 1000 dozen goods on the road between mill and dye house. It often happens that goods which are badly needed get side-tracked somewhere on the road, and goods of which there is a surplus will come along all right.

The mill doing its own dyeing avoids this, and everything should go along smoothly.

A certain number of hands can be employed to do the work of boarding and pressing and keep the work going through regularly. But if a mill is sending its goods out to be dyed, delays will certainly occur, and there may be times when there will be no goods in the mill to finish, and some of the hands will have to be laid off, which is not good policy. Then the goods which were delayed come in together with others which were not delayed, and the mill finds that it has more on hand than it can handle before the goods dry out. Consequently poorly finished goods are obtained. Some of my readers may say: "O, we just take a sprinkling-can and sprinkle them, and they come out all right." Do they finish all right? It is the opinion of the writer that they do not take as good a finish as when properly dampened. The mill with no dye house is compelled, in a case like this, to resort to the sprinkling-can, or some other method of redampening the goods, at an additional expense.

The mill with the dye house has the advantage in many ways. A mill making, say, 200 dozen hose per day, could do its own dyeing economically. A good dyer is necessary, of course, to whom a good salary should be paid. He should do considerable work himself, and ought to turn out good work at from 3½ to 5 cents per pound net, according to color. A mill with a dye house can do a great deal of fancy work, such as extract and resist work, also printing.

The capital invested in the plant for dyeing is not very large and is partially and indeed often wholly offset by the quicker turn-over of the product and the fact that there is not so

much capital tied up in goods away in process of dyeing. In a large hosiery centre like Philadelphia or Reading, perhaps some of these advantages are minimized, but for isolated plants, I believe it is the best policy to do their own dyeing.

NEEDLE.

The Advantages of Sending Hosiery to a Job Dye Works.

It is a fair assumption that a concern which makes a specialty of doing one process and does it in large quantities and does nothing else, ought to be able to reach a higher state of perfection than another concern who makes the dyeing process only a portion of its work.

Comparatively few hosiery manufacturers are practical dyers. They are obliged to hire a dyer, and must depend upon him for their work. Unless the plant is a very large one, they cannot afford to pay the same wages to the dyer that the custom dye house does, and, therefore, they cannot expect to get the same grade of talent which the custom dyer can give. If they do pay high wages to their boss dyer, it makes the cost of dyeing too high.

The custom dyer is usually a man who has practical knowledge of his business, gained through long experience, and the fact that he has branched out into business for himself and built up a successful establishment usually shows that he not only has technical skill, but general ability for the administration of a business enterprise. Handling as the custom dye house does, such a large quantity of goods, the cost is brought down to a point so that the price charged to the mill for the dyeing is less in most instances than the mill could do it themselves, and at the same time they are getting a very high grade of work.

If the dye works is a responsible concern, and most of them are, the hosiery manufacturer has some one to hold responsible in case of bad work. If he does his own dyeing, he has no one but a salaried dyer to throw the blame on and no financial recourse. A good dye works studies its customers' needs, and with its facilities is usually able to put through special lots of work in shorter time than a mill could do it themselves. Very often the hosiery manufacturer is himself to blame for the delays which he lays at the dye works' door. If he planned his shipments systematically and kept the dye house advised of what might be expected, the work could be so planned as to run smoothly and with little friction. In the case of an emergency, the hosiery manufacturer has the facilities of a plant many times as large as one that he could afford to operate profitably himself, and in slack times, when he has little or no work, he has no interest to count on a dye house plant and no dyer's wages to pay on a reduced production, but he simply stops sending the goods out to be dyed, and the expense stops at the same time.

In the case of very large plants so situated that they are not convenient to good custom dye works, it may be an advantage to operate their own dye house, but when the smaller hosiery manufacturer considers:

1st. The expense of a plant.

2d. The necessity of a skilled dyer at good wages.

3d. The enhanced cost per pound of dyeing in a small way as compared with a large production.

4th. The expense and interest on a dye plant when the mill shuts down or is running slack.

5th. The annoyance and loss caused in this department through possible imperfect work, it would seem as if they would outweigh whatever advantages are to be gained by doing one's own dyeing.

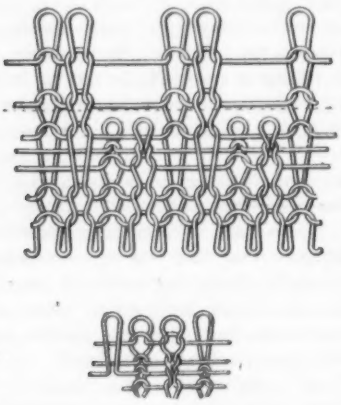
DEAN.

—Dyeing of wool and cotton goods in two colors offers no very special difficulties.

Close Knitted to Open Knitted Work.

We show, herewith, several illustrations relating to methods of forming knitted fabrics, or more particularly to an improvement of changing from close-knitted work to open-knitted work, or, more strictly, to means for dropping out certain of the stitches, so that the work is less closely knitted than before the stitches were dropped.

The method here shown is especially serviceable in making the change from one article to another, of which a portion is formed of close-knitted work and a portion of open-knitted work, such as the sleeve of an undershirt, which may be made by



starting with the cuff formed of open work, as by the use of alternate needles of a knitting-machine, the remainder of the sleeve having an increased number of stitches in the same width, and then changing from the upper end of a completed sleeve to the cuff of a new sleeve without interrupting the knitting operation, though it may be employed in any work, whether machine or hand made, wherein without narrowing some of the wales are discontinued.

The method as here illustrated consists of securing the stitches which are to be discontinued by introducing into each a key-stitch, disconnected from the wales which are to remain, which prevents it from being drawn out by the stitches which are continued in the further development of work.

We illustrate an enlarged analytical section of a piece of fabric, a portion being closely knitted and a portion of open knitted, intermediate of the two being represented as formed without the use of tension; also, a detail of a portion of the same work with tension applied.

Non-Shrinkable Underwear.

THE LATEST DEVICE FOR 1900.

An old saying of Bobbie Burns, the Scottish poet:—

"A little nonsense now and then
Is relished by the best of men."

So comes the device for non-shrinkable underwear, which is not protected by a patent. I will show how it is accomplished. It matters not whether the goods are small or elastic, for the same will increase in size, according to the avoirdupois that is used for this new process, which was lately invented in the city of Boston, not by a student of any of the schools or colleges who may have studied for years without being able to sell a design, simply because impracticable, but by a lone washerwoman.

Mr. J. L., a good-natured old gentleman, said to his wife: "Now, Maria, be sure and tell the washwoman not to shrink this new woolen underwear of mine into a knot," as he displayed a purchase of some very fine underwear he had made in one of the large stores in Summer street. "Tell her to stretch them when she washes them, and that will keep them in size and shape." The wife promised to caution the washwoman, and accordingly when the next washday came around she instructed the laundry artist about the first suit. The garments came through the ordeal without any appreciable change in size. So did the next suit, and the third. Every washday the same caution was repeated, and the conscientious washwoman pulled and tugged at the shirts and drawers until the threads were

strained. "Well, these garments are keeping their size," muttered the husband, as he put them on for several weeks. After they had gone through several washings, he noticed the sleeves of the shirt were a little long, and the legs of the drawers crowded his hose and shoe tops. A week or two later he found it necessary to put a fold in the waistbands, and the folds around his ankles were getting larger. Before another month passed he grew alarmed. Still he hesitated about saying anything that might change the size of the garments in the opposite direction, as he had some experience in the gradual shrinkage of underwear. So he decided to keep cool. But the stretching continued. Each washing necessitated an extra and a higher hitch. He knew something had to be done, or he would soon be obliged to discard one of the garments and use the other as a union suit if the muscular laundress was not stopped. He made it a matter of secrecy with his wife to call a halt on the stretching. The next wash day, the wife surprised the washwoman in the basement laundry while eating her lunch. She discovered her sitting in a swing, made of the husband's underwear. The secret was out.

The husband is hoping by spring that the underwear will return to its normal condition. Meanwhile the resourceful washwoman munches her lunch while sitting on a kitchen chair.

The first patent issued in this country, of which there is any record, was granted to Solomon Hopkins, July 31, 1790, but there is none on the above stretcher.

A. SCOTLAND.

—Though the introduction of alizarine into commerce dates as far back as 1869, it is principally during the last ten years that this parent substance has gradually yielded a series of dyestuffs comprising all shades, and the use whereof has rapidly become indispensable in the dyeing and printing of all classes of goods.

Singeing Hosiery.

Apparatus for the singeing of hosiery has been the subject of two inventions of late.

One of these machines has been designed for treating goods so as to give them the desired finish on the exterior, by removing the lint and fuzz. It has been the custom, heretofore, we think, to subject stockings to a rubbing action for the purpose of removing lint and fuzz, the articles being generally placed in a revolving drum, where friction between interior surfaces thereof and the goods is relied upon to produce the desired result, which is sometimes promoted by the use of chlorin gas or other chemical agents. Many object to this mode of procedure, owing to the liability of the goods to deteriorate by rotting, shrinking, and losing weight and elasticity, the difficulty of freeing the goods from injurious substances often used in the operation, and the accumulation of fuzz inside the stocking by reason of the fact that the rubbing action affects the inside as well as the outside surfaces. It is now proposed to overcome all of these difficulties by pursuing a wholly different mode of procedure, consisting, essentially, in first "boarding" the stockings—i. e., stretching them on forms—then singeing the outer surfaces of the boarded stockings, and finally brushing the singed surfaces to remove lint and fuzz. In an apparatus for use in carrying on such operations it is desirable to repeat the singeing and brushing a number of times to insure the removal of all matter calculated to detract from a finished appearance of the surface of the goods. By following the mode of procedure with an apparatus of the character here alluded to advantageous results are said to be obtained in that the desired exterior finish is imparted to the goods by the removal of lint and fuzz, while the interior is not affected, but is left with the desired soft surface. No injurious effects ensue such

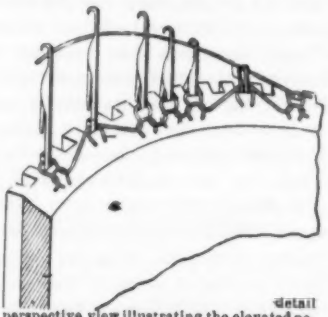
as are often experienced from the use of chemicals, for none are employed in carrying out this process as it is of a mechanical nature. Moreover, frictional action is not relied upon in any degree, so that no loss of weight or elasticity is experienced.

Another machine has been designed for singeing hosiery, to remove the fine "fly" or "fuzz" thereon, so as to give the article a high grade of finish. A valuable feature is claimed for this apparatus, because of its simplicity, comprising a comparatively small number of operating parts, not likely to get out of order, and so constructed and arranged as to singe both sides of the stocking at once, thereby adding greatly to the capacity of the machine, and, consequently, reducing the cost of the singeing. This apparatus comprises, among other things, a pair of burner tubes, constructed to throw their flames outward at an angle, so as to act upon and singe both sides of the stocking at one operation.

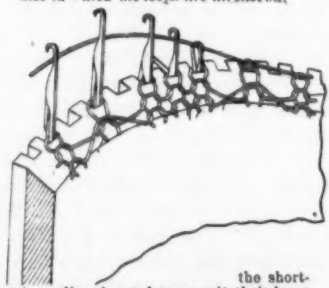
Knitting Seamless Tubular Fabrics.

We illustrate a new device for making a seamless tubular fabric, with special reference to machines of the circular type. This fabric may be knitted on the needles fed by a single thread.

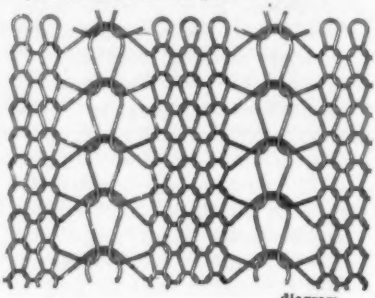
The principal object of the present method is to provide a single-feed circular-knitting machine, wherein a seamless tubular knitted fabric may be produced having regularly-woven portions separated by open-work or lace-work portions extending the length of the fabric, and consists of a circular-knitting machine having a single feed and provided only with cylinder-needles arranged in sets of ordinary or short-latch needles separated or interspersed with long-latch needles, the feed being carried by a regular cam-cylinder provided with an auxiliary cam adapted at alternate revolutions of the cam-cylinder to raise both long and short latch needles, so that the thread in one instance will rest below the latches of the short-latch needles only, whereas in the other instance it will rest below the latches of both long and short latch needles.



detail perspective view illustrating the elevated position of the long-latch and short-latch needles in which the loops are all cast off.



the short-latch needles elevated to permit their loops to be cast off And the long-latch needles depressed so that their loops will be retained.



diagrammatic view of the fabric spread out upon a flat surface.

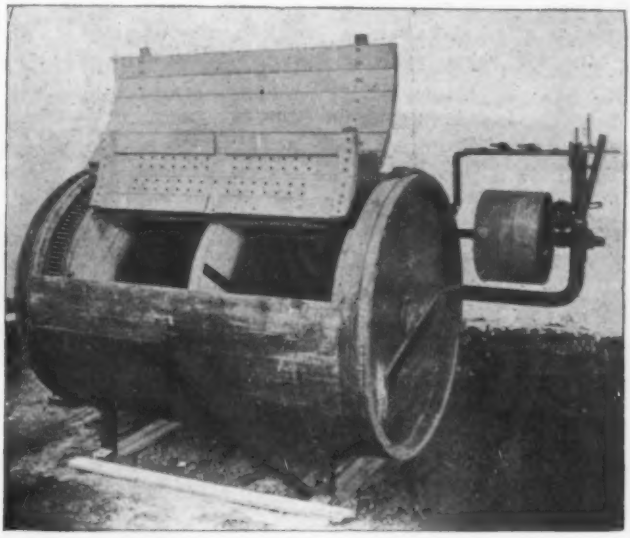
—During the year 1899 there have been issued from the various coal tar color works in England and abroad, 160 new dyes.

—The dyer has at his command a greater variety of methods for dyeing mixed silk and wool goods than for any other class of mixed fabrics.

Chroming Machine for Hosiery Dyeing.

The illustration represents the chroming machine built by H. C. Weihe, 2809 N. Fairhill St., Philadelphia. It has been perfected from time to time until now it is believed to contain every feature of value requisite for such purpose. It is very substantially built. It occupies a space 8 ft. long, 4 ft. 6 in. wide and 5 ft. high. Lots ranging from 10 to 200 lbs. may be chromed at each operation, and if run at its full capacity, it will chrome 2,000 lbs. a day. A partition divides the machine into two sections, each of which holds about 100 lbs. Besides their use in chroming processes, a number of dye houses use them for soaping and softening the goods, and they are extensively used also in laundries. Among the prominent dye houses using them, we note Frankford Hosiery Mills (2); Thomas McCauley, Philadelphia (3); Rambo & Regar, Norristown (3); Tarboro Dye Works, Tarboro, N. C. (2); Barnesville Manufacturing Co., Barnesville, Ga. (3); W. F. Taubel, Riverside, N. J. (4); Thomas Buck & Co., Philadelphia (2), and many other plants have single machines.

Besides the chroming machine, Mr. Weihe's line embraces an improved tomtom and oxidizer.



—Formerly the army cloths for the Turkish Government were manufactured entirely in England, but now the Government have a factory of their own at work, producing the bulk of their requirements and turning out 1,000,000 yards of cloth yearly.

—Up to 1890 the alizarine colors were represented by various brands of lizarine-red, by alizarine-purpurine, anthracene-red, alizarine-orange, alizarine-yellow R, anthracene-yellow, cœruleine, alizarine-blue, galleine and anthracene-brown.

—The merchants in Turkey are good buyers, but do not maintain a corresponding reputation for their payments.

—Turkey Red Oil, Sulphated Oil, Soluble Oil or Olein.—These names are applied to oily liquids obtained by the action of sulphuric acid on certain vegetable oils.

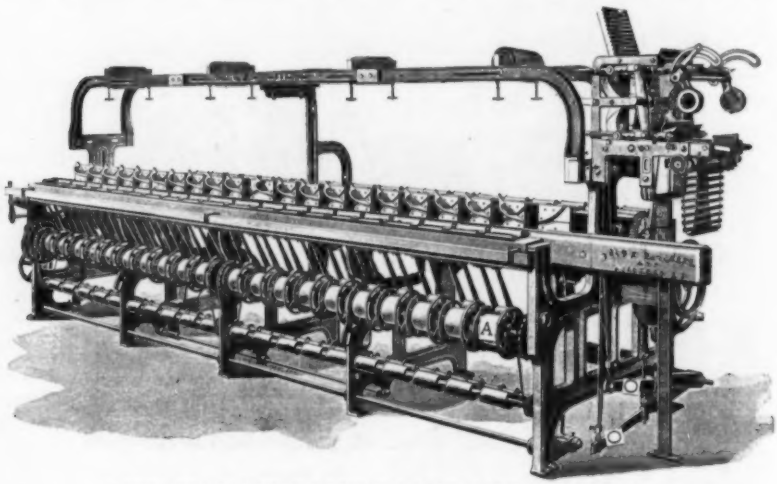
SILK DEPARTMENT.

Ribbon Manufacturing.

The manufacture of ribbons differs from broad silk principally in the looms used therefor. The shuttles for ribbons are operated positively by means of a toothed rack and pinions, carried in the baton and engaging with the shuttles.

The frames of the looms are from 15 to 20 feet long, and six to nine feet wide. The style of looms known as German, have the baton swinging from the top. At the back and on top is a series of pegs on which the warp spools are placed, the warps being wound thereon in untwisted rope form. The warp passes over guide pulleys placed at the top of the loom, under glass rods secured on a rail at the back of the loom, thence through the harness and reed. A grooved pulley, provided with weights, is hung on the warp between the upper stationary guide pulleys. The warp spool is slackened and allowed to unwind sufficient warp, until the suspended weights are clear of the floor. The spools are then secured and the loom operated until the weights reach the top, when they are again lowered. This action is repeated as often as required.

In looms of this description no lease rods are used, the warp passing through a reed to which is tied light weights, that are sufficiently heavy to hold the reed and open the warp, but when the threads through any cause stick together, the reed is carried forward with the warp. The weaver, by watching the reeds, notices the displacement and remedies the trouble.



HIGH-SPEED RIBBON LOOM, WITH STRAIGHT OR CIRCULAR SHUTTLE BATTEN,

A—Sand Rollers. O—Picking Rollers.

The harness shafts are of sufficient length to reach half the length of the loom, the harness being knitted thereon in spaces.

The shedding mechanisms for these looms are principally open shed dobbies, or jacquards, of about 32 hooks connected to levers. On the levers are metal straps, to which are attached lengths of wire reaching to their respective connections, to which are secured cords connected to the harness. A good connection often

used is a round leather strap over the harness sheave, one end connected to the aforementioned lengths of wire, the other end provided with a wire hook with a swivel coupling at its lower end. A metal clip is on the harness shaft in which is another similar wire hook, the upper length connected with the swivel coupling, the turning of the swivel raising or lowering the harness. Secured to the bottom shafts of the harness are weights in place of springs.

The harnesses are obtained with the warp ends entered, so that when the harness is hung in the loom, the warps are only required to be twisted, and the reeds entered.

The number of ribbons woven on a loom depends on their width and style of baton used, as hereafter referred to; as many as 64 being often made.

The shuttles are bow shaped and are provided with a cavity in which is carried the quill containing the silk filling. The quill resembles somewhat a sewing cotton spool, but of much smaller diameter, and is carried on a pin secured in the shuttle. A tension brake is also placed in the shuttle, to bear on the quill; also two glass rings in opposite positions are attached to worm-like springs, secured in grooves inside the shuttle, with a central glass ring in front of shuttle, and an eye, completes the means to guide and control the filling as it is drawn from the quill.

The shuttle is propelled and drawn between the warp at each beat of the baton. As the latter moves forward, the bow of the shuttle is carried considerably past the end of the cloth, which causes the filling to be drawn tight between the warp and the quill with the tension of the worm springs, which expand. As the shuttle is passing through the warp, the worm springs contract and take up the loose filling.

The filling is generally five and six end filling, and often eight and ten end, or ply. The number of picks put in vary from 40 to 120, and the warp threads of single silk from 60 to 300 per inch. The standard weaves being gros-grain (taffeta) and satin.

In the practical weaving of ribbons, when it is known that competition is the life of the trade, and that many times the orders are for all that can be produced in a given time, ability to produce is a valuable consideration. Suppose a loom having about 40 spaces of No. 7 ribbon (about 1¾ inches wide) was started with full quills, and warps of even length, it may be considered an impossibility to practically and profitably put the exact length of filling on each quill constantly, to prevent breakages in the filling, and faults in the warp, so as to have each quill become simultaneously exhausted to a predetermined point; and as the stopping of the loom for the care of one ribbon stops the whole 40, the weaver generally contrives to have as many quills run to a finish together as possible, and has full quills in readiness opposite each space.

Alertness is a desirable quality in ribbon weaving, to keep constant watch over 40 quills, 40 warps, and 40 back reeds.

The weaver further requires the knowledge necessary to change the harness, and to twist in the warps, though young boys are generally employed for twisting; and the woven ribbon is taken from the loom by the "boss" generally. A reel is used and each piece measured. A piece is 10 yards long, and the price paid is for this length of ribbon.

On narrow ribbons the greatest care is required to make nice edges, and to keep the ribbon the right width. The looms run at a speed of about 75 to 90 picks per minute.

A ribbon of one and one-half inches width would have a reed space of two inches, the shuttle measuring in length about three and one-half to four inches, so that a loom with a baton to weave 40 ribbons would require to be 240 inches long, exclusive of the ends on which is secured the actuating mechanism. For economizing space a baton is quite often used

in which the shuttle travels in a part of a circle, the radius of the circle conforming to the width of the ribbon.

The above described loom may be termed the hand loom of the ribbon industry, and still very largely in use for fancy ribbons.

The accompanying illustration is a lately devised fast running ribbon loom, constructed similar to the broad loom, the warps being carried on individual beams, lease rods used, a measuring clock attached to the loom, and other valuable features.

JOHN C. BROOKS.

Preparing Silk Yarns for the Loom.

On the hard-silk hank-winding frames there are eighty spindles, forty on each side, which, when properly looked after and kept in good running condition, will turn out a large quantity of work. And as as the object of both the winder and overlooker is to get as much work from these spindles as they are capable of giving, all the details of the frame and the various methods employed to overcome some of the everyday difficulties should be thoroughly mastered.

Some classes of silk yarns, such as trams and the better grades of Italian and French raws, being cleaner and stronger, can be wound more easily, and will, when being wound, run at a much faster speed than the lower grades of raws and singles. As this is an important point, the overlooker should ascertain at what speed the class of silk winding will run best, for if the frame is running too fast for the yarn, the ends will be continually snapping, while a larger proportion of bad bobbins will be made, for yarns are apt to run on slack and cause a soft bobbin, which, when being rewound, will cause extra waste. If, on the other hand, the frame is allowed to run too slowly, the cost of the hank winding is materially increased. From experience it is found better to let the frame run slightly on the slower side, rather than on the faster, as a larger output and better-wound silk are the practical results. A few experiments on these lines could soon be made, for the speed of a frame can be altered without much trouble in a short time by changing either the driving or the driven wheels at the end of the frame. As each side can be run independently of the other, two speeds may be tried on one frame. By watching the silk run on each side and then comparing the results, it will be found which is the best speed for the larger production, and which is better adapted to the yarn itself.

Another important point is the weighting of the swifts. Round the barrel or centre of each swift a weight is loosely hung, which, if not of the right proportions, will cause a great amount of trouble. If the swift is not sufficiently weighted it will very often overrun itself, or if weighted too heavily it will not run fast enough for the take-up of the bobbins; and both are faults which cause ends to break, and which eventually tell against the cost and production of the yarn. Every swift should run perfectly true when in its place on the frame. It must not run back in the contrary direction after having once stopped; it should be adjusted to run to a dead stop.

Every winder should be supplied with two kinds of spindles, one set with wood heads, to be used for finer silks and other lots that do not require a great amount of "pull"; and another kind with iron heads, to be used for stronger and coarser yarns. Since the size of the counts varies considerably, and very often in the same hank, the thread is very small and consequently tender, while at other places it is very thick and strong. The difficulty of winding may be overcome somewhat by using the two kinds of spindles as suggested. The bobbins used during the hank winding of the larger hanks must of a necessity be sufficiently large and heavy enough to pull the swift round rather easily. The bobbins generally used are 3 in. in diameter, while for the ordinary-sized

hanks a bobbin of a much smaller diameter, but of the same length of traverse, is used, and on to which a long length of silk can be wound. When the spindle head does not "bite" sufficiently on the drums of the shaft, a small pinch of powdered resin will be found useful in helping to get the required keenness; or when the spindle bites too keenly, French chalk dropped on the drum will ease it immediately. Glass eyes are generally used for guides on hard and soft silk frames. After being in use a while the yarns wear into the glass, which in turn rubs and gives the silk a downy appearance; and as silk loses much of its brilliancy when downy, the eyes should be changed as soon as they are found to be defective.

Many winders have a very careless habit of throwing down ends cut off the silk after they have tied a knot, which very often get entangled in the swifts or wrapped round the spindles, filling and choking them up with bits of fly and waste, and making it almost impossible to get the swifts and spindles to run properly, when good winding is out of the question. All classes of yarns should be got through the various processes as cleanly and with as little work put into them as possible, for if there be too much of this, the yarn will become rubbed and tender, and cause trouble to the weaver. In a factory where a large number of winders are employed, loss of time and waste, by neglecting details like the above mentioned, amount up to a great deal in a short time, and if due consideration is given to them, a large saving in time and waste would be bound to follow, while the yarns would be in a much better condition when they reached the loom, either as weft or warp. When the raws have been hank-wound, the next process through which they pass is on the redraw frames. Unless the silk requires cleaning, this process is not necessary for yarns which are to be spooled for weft, but when used for warp they should always be redrawn, for the bobbins as taken from the hank-winding frames are far too soft to bear the strain put on them while on the warping frames, the ends being liable to cut or dig down near the edges of the bobbins; also, it is seldom that hank-winding bobbins can be put on the warping frames. The bobbins, after being redrawn, contain a much longer length of silk, which is a consideration, for it means a less number of knots to be made in the warps. If the slubs and long knots that are usually present in the yarns have to be taken out, this can be done on the redraw frame, for this is fitted up with what are known as steel knives or cleaners, which also serve the purpose of guides. Fixed in an upright position on a rail running the full length of the frame, and moved by the action of the traverse motion, these knives can easily be set by the redrawer to clean any class or counts of yarn, for after being set properly a slub or knot coming up on the thread is at once stopped by the knife. The operative employed at the frame then cuts off the slub or knot, ties the two ends together, and sets the thread running again.

This class of work is comparatively easy, and requires very little experience beyond setting the guides straight for the bobbins; and when once these knives are thus set, a frame of eighty spindles can easily be managed by a very young girl. When the frame is only required for redrawing silk yarns, the only alteration that is necessary is the opening out of the knives so as to allow the thread to pass through quite easily. The yarns on the redraw frame may be run at a great speed, as the silk only passes from one bobbin on to another, the thread passing through two rods which hold it tight and keep it from overrunning itself. The frame should be supplied with a pair of cone pulleys, to allow the speed to be altered with very little trouble.

In a weaving factory where the managers of the firm are fully alive to the requirements of the trade, they are constantly weaving samples of

new goods, consequently bringing into the business fresh classes of yarn, which the winding overlooker has to get into work at once; therefore the frames should always be in good repair and supplied with all the accessories necessary for a sudden change on to any new line that may be required of them.

The frames on which discharged and dyed silk—or, as it is universally called, soft silk—is wound are in working principle very similar to the hard-silk frames, having the same traverse motion and spindles, but fitted up with barrels instead of swifts, on which the small ordinary hank is wound which cannot be wound on the swifts. The soft-silk hank runs over the top and bottom barrels on the frame, which revolve freely in their brackets. The top barrel is fastened to the frame, while the lower one, which runs in a "battledore," is capable, when required, of being moved either up or down a wood stay, to which it is afterwards secured by a wood screw fixed in the "battledore." The ends of the barrels have each a brass peg through the centre on which they revolve, and are made from hard wood, with boxwood spindles connecting the two ends. They must all be perfectly smooth. The nature of the silk, after being discharged and dyed, makes it disposed to catch and stick to anything which is slightly rough that it happens to come in contact with. As often happens, the barrels get knocked by falling on the floor or against the frame, when they should be rubbed smooth at once. The silk in this state does not allow a great amount of strain to be put upon it, and this amount is only got by lowering the bottom barrel as far as is deemed advisable for the yarn to run well. Spindles with wood heads are used, while the frame is run at a very slow speed compared with those on which the other classes of silk are wound.—Textile Manufacturer.

Imitating Silk.

There has recently been issued a German patent for the treatment of fibres, yarns and fabrics to imitate silk. The treatment is as follows:

Silk is dissolved in an alkaline solution while heating. The fibres, yarns, or fabrics to be enriched are soaked in this solution, freed from any excessive quantity of same, and then treated in a bath of alkaline bicarbonate in excess or hung in a large chamber through which gases containing carbonic acid—for instance, washed products of combustion—are conducted. The carbonic acid contained in the products of combustion or in the alkaline bicarbonate of the bath combines with the alkali of the silk solution, converts it into an alkaline carbonate, thereby depositing the silk from its solution onto the fibre. After drying the silk to the fibre the alkaline carbonate is lixiviated by warm water, a portion of same is rendered caustic again by the addition of lime, and thus serves for dissolving fresh quantities of silk, while the other portion is converted by the passage of products of combustion into alkaline bicarbonate, and is used again as a bath for the deposition of the silk on the fibre, or the solution of bicarbonate is heated and carbonic acid expelled from it, which gas, as set forth, may likewise be employed for saturating the alkali and separating the silk.

—About 1820 printing with solid blue and catechu led to a better knowledge of the reactions of the latter with bichromate, and to the study of the behavior of logwood dyes to bichromate. In this way black logwood dyeing was founded, and also of steam-catechu, both in 1832, and paved the way for steam chrome black, which assumed importance in the sixties.

—When mixed silk and cotton goods are to be dyed with two colors the dyeings are best done in two baths.

American Silks at the Paris Exposition.

The silk manufacturing industry of the United States will be represented at the Paris Exposition, notwithstanding the fact that there lacked a disposition on the part of manufacturers to do anything of this kind when the matter was first presented to them. The exhibit in the aggregate will be a creditable one, as can be imagined by the names of those who have contributed towards it, as noted below. The exhibits are now on their way to Paris. As will be seen, the list of exhibitors comprises sixteen concerns, who have an invested capital in the industry of $3,250,000, all in excellent standing.

Names.	Locations.	Goods to be Exhibited.
Empire Silk Works	Paterson, N. J.	Necktie silks and scarves.
Pelgram & Meyer	Paterson, N. J.	Dress silks, ribbons.
Stern, Pohly & Hermann	Paterson, N. J.	Fancy silk.
Cardinal & Becker	Paterson, N. J.	Fancy linings.
Doherty & Wadsworth	Paterson, N. J.	Dress silks.
Anderson Bros.	Paterson, N. J.	Broad silks.
Johnson, Cowdin & Co.	Paterson, N. J.	Ribbons.
Paterson Ribbon Co.	Paterson, N. J.	Ribbons.
Smith & Kauffman	New York	Ribbons.
Liberty Silk Co.	New York	Dress and fancy silks.
Neuwitter & Migel	Astoria, N. Y.	Dress and fancy silks.
Castle Braid Co.	Brooklyn, N. Y.	Braids, trimmings and covered buttons.
Julius Kayser & Co.	Brooklyn, N. Y.	Gloves and mitts.
John N. Stearns & Co.	Elmira, N. Y.	Black dress silks.
Bridgeport Silk Co.	Bridgeport, Ct.	Dress silks and fancies.
Richardson Silk Co.	Belding, Mich.	Sewing silks and twists.

Composition for Textile Fabrics.

A composition has been recommended for the treatment of textile fabrics, especially for the purpose of fulling, filling, closing, softening, giving additional body, and both brightening and enveloping their colors and improving their appearance and finish. It comprises a mixture of chlorid of magnesium, chlorid of sodium, and chlorid of ammonium, either in their dry forms or in solution.

These ingredients in a dry form, reduced to a granulated state, and thoroughly mixed, is preferred to their being used in solution. In lieu of chlorid of ammonium, aqua-ammonia or ammoniacal gas may be used.

It is preferable to use in the composition about forty parts of chlorid of magnesium, one hundred and sixty parts of chlorid of sodium, and two parts of chlorid of ammonium; but these proportions may be varied to any reasonable or desirable extent.

In use, the composition, if dry, is dissolved in water, or, if in solution, water is added to it and the textile fabric to be treated is saturated with it, whereby the fibres and threads are caused to absorb the same and to be swollen by it. The surplus is removed by pressure or an extractor and the fabric then dried; but the fibres and threads are left in their enlarged or swollen condition and in a softened state. These ingredients may be mixed together in their dry state or in solution and the water then added to them, or they may be mixed originally with the water necessary, the quantity of which may vary, according to the result which it is desired to attain.

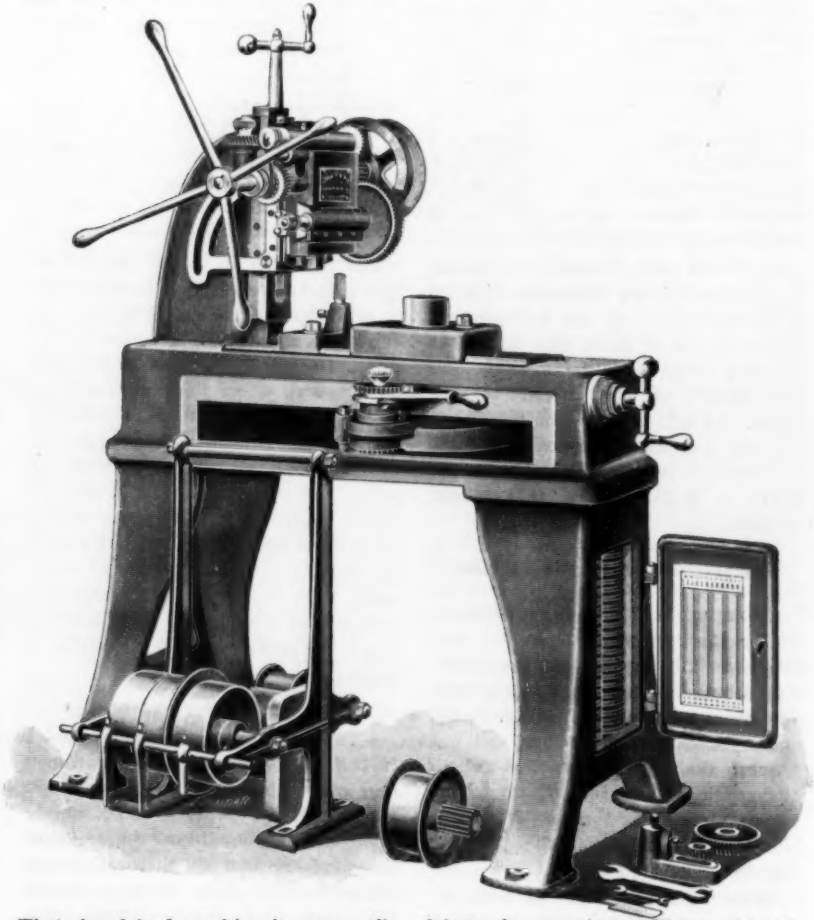
—The features of the mohair trade in 1899, in England, were a continued and increasingly large consumption throughout the year, running mainly upon the fine qualities required for dress goods, and to meet this consumption there was an unprecedentedly heavy importation of the staple. But business, although on a large scale, has been done on a small margin of profit, and with a much more regular demand than in previous years.

POWER DEPARTMENT.

ELECTRICITY—STEAM—WATER.

Whiton's Improved Semi-Automatic Gear-Cutting Machine.

The illustration shows a new machine of this type which has recently been brought out by the D. E. Whiton Machine Co. of New London, Conn.

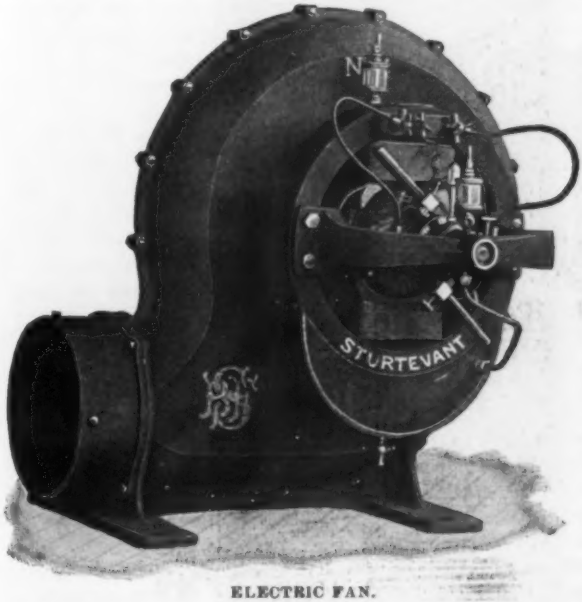


Their hand-feed machine is very well known to textile manufacturers, and its design is especially adapted for their use. The machine illustrated is similar to the hand-feed machine, but is provided with a power feeding cutter head by which it is made semi-automatic. This feature is desirable on many classes of work, as it greatly prolongs the durability of the cutters, improves the quality of the work, especially in the heavier pitches, and also enables the operator to attend several machines, or to other work. The feed is positively and powerfully driven by gearing. Three change gears are furnished giving feeds adapted to most cases, and other gears can be made, if required.

An adjustable stop disengages the feed, after which the cutter carriage is returned, the blank spaced for the next tooth, and the feed re-engaged

by the operator. All other details and adjustments are the same as for the hand machine.

There are several very useful attachments designed both for the hand feed and semi-automatic machines; viz., the centre attachment, which is especially useful on a large class of work usually performed on the Universal miller; a vise attachment, which permits cuts to be taken at any angle, and an arbor support when a large number of duplicate gears are to be cut on a long arbor.



ELECTRIC FAN.

Their new 1900 catalogue, just issued, contains very clear illustrations of these different attachments and of each style of machine, which has been especially adapted for the wants of textile manufacturers. It also contains a long list of 250 or more cotton mills who are using the Whiton Gear-Cutting Machine in their repair shops. A perusal of this list shows the value of the machine to mills remote from machine shops. In the Southern States the list of mills using it seems almost a directory in itself, and shows its value to isolated plants.

Electric Fans.

In the accompanying illustration is presented one of the Sturtevant Monogram Type Electric Fans. The shell of the fan is of cast iron exactly similar in proportions and form to that used in the regular Monogram Blowers and Exhausters. This fan is arranged as an exhauster, having the side to which the motor is attached entirely closed, so that air and dust will be drawn across the motor.

The field ring of the motor is of wrought iron and is bolted directly against lugs which project from the side of the fan.

The poles are two in number, also of wrought iron, and carry the field windings as shown.

The armature is of the drum wound type, and the shaft carrying the same is supported in ring oiler bearings suspended in yokes projecting from either side of the field ring. To avoid any trouble from oil it is dipped directly into a tank attached to the under side of the field ring.

The entire arrangement is extremely compact and stable, and is susceptible of support in any desired position. In small sizes it is sufficiently portable to be used for temporary location, as for instance in different parts of the hold of a ship.

Plants of this type are usually built to operate at pressures of from 1 oz. to 5 lb. per sq. in.

—The number of impediments to the production of designs is much less in jacquard than in the shaft arrangements.

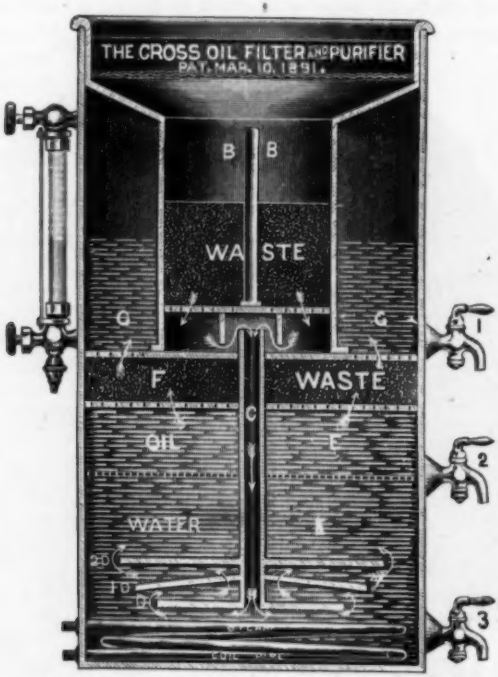
The Cross Oil Filter.

The Cross Oil Filter, manufactured by the Burt Manufacturing Company, Akron, Ohio, and which we show in the accompanying illustration, will be on exhibition at the Paris Exposition, and has been selected for the equipment of the power house in the United States machinery department at the exposition. This filter has been on the market for the last nine years, and has established for itself a reputation in twenty-four countries and been adopted by five governments. One of the largest orders recently received for it came from Yokohama, Japan; and the British government has sent in orders for it during the past year. The Metropolitan Supply Company, of London, one of the largest electrical concerns in the British Empire, has recently placed an order for 90-gallon filters. This gives an idea of its recognition as a filter possessing superior merits that has become known in all parts of the world for the economical saving of oil.

As manufacturing concerns must know, a large portion, amounting to 50 to 75 per cent., of the oil used on machinery is discarded as waste, because of the fact that it becomes filled with dirt and grit. The purpose of this filter is to save this waste oil, and free it from impurities, so as to fit it for use over and over again with perfect safety.

So confident are the manufacturers of this filter as to the saving of oil that can be made by its use, that they are willing to give a thirty days' trial of it to any prospective user, upon the condition that if not found satisfactory and equal to representations in every respect, it may be returned at the expense of the makers.

It is claimed, and we think it can be readily seen, that the simple process of filtration, as here shown, does not affect in the least the lubricating properties of oil, but rather has a clarifying and purifying effect. The capacity of the filter depends upon the



SECTIONAL VIEW OF THE CROSS OIL FILTER.

heaviness of the oil to be filtered. The manufacturers of it guarantee the actual capacity of a filter to be equal to its rate capacity. It is made of extra heavy galvanized iron, all joints soldered, lapped and riveted. All of the inside work is rigidly braced and reinforced.

The operation of the filter may be understood by referring to the accompanying illustration.

The bottom chamber (E) is filled with pure warm water, which is heated by means of a steam pipe passing through the filter. Very little steam is required, and if the filter is kept in a warm place, it will not be necessary to make steam connection at all.

The waste oil is poured in through a top grating. It then passes into chamber B, through the layer of waste, which collects all the heavier impurities. Thence through the perforated bottom of chamber B, down in the direction shown by the arrows into tube C, and from here onto filter plate D, where the increased weight of the water has a tendency to keep the oil back in tube C. However, the pressure of oil in chamber B forces it down and spreads it out over plate D, in a very thin film which constantly changes surface and grows thinner as it travels from the centre to the circumference of plate D, thus exposing every particle of waste oil to the action of the water. It then flows upon plate 1D and 2D, going through the same process in each case. When the oil leaves the filter plate 2D it is in a finely divided state of separation and thoroughly mixed with water which washes it out and from which it separates by gravity all the remaining impurities, which settle in chamber E, and can be removed through cock No. 3. From plate 2D the oil again filters through the stratum of filtering material F, and from there it rises to chamber G, the reservoir containing the purified oil. It is then drawn off as required from cock No. 1.

Practically no attention is required after the filter is started, and the first cost is the only expense, excepting a few cents per year for waste. The Cross Filter cannot clog up, and there is nothing about it that can break or get out of order.

Wool Manufacturing in Oregon.

Oregon is a wool producing State. The clip for 1899 was about 22,000,000 pounds, of which only a small proportion (3,000,000 or 4,000,000 pounds), is used by local mills of that State. The balance is shipped to the East, to be returned later made up into cloth, blankets and clothing. An effort is now being made to make Portland the wool market of Oregon, as San Francisco is of California; and by the erection of a woolen mill there, with cheap transportation from eastern Oregon and the Willamette Valley, this, it is thought, can be accomplished. Portland's shipping facilities for the products of a local woolen mill are as good as can be found on the coast, but the great feature is the unsurpassed climate of that section of the State for wool manufacturing. The climate has no superior. Evenness of temperature and absence of electricity from the atmosphere, and freedom of the water from alkali, are very rarely so favorably united as they are there. Goods can be made there, like the famous Scotch chevlots, from the Oregon "valley" wool, and kerseys and fine meltons from the eastern Oregon fleeces. This, of course, implies that proper machinery is used for the work, operated on such a scale as to secure skilled labor.

It is now proposed to form a corporation in Portland, with a capital stock of $100,000—1000 shares at a par value of $100 each. What is wanted in this connection is to secure a practical, experienced woolen mill man, with some capital, to take hold of the matter, and Portland will subscribe the balance of the money to build and equip the mill.

—In 1826 alizarine was first made from madder.

DYEING DEPARTMENT

Dye Recipes for April.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

Recipe No. 49.

Pink on Cotton Yarn.

Direct Red Extra on 100 pounds of cotton yarn.

Prepare dye bath with

¼ lb. Direct Red Extra.

(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)

20 lbs. Common Salt.

Enter yarn at 140° F., and while turning raise to the boil. Continue boiling one hour. Then wash and dry.

Direct Red Extra gives a very rich and blue shade of pink and is especially adapted for use on underwear. It dyes very evenly and produces a shade of great fastness. This dyestuff also produces clear and full shades of red up to 2 pounds of dyestuff for 100 pounds of goods.

Recipe No. 50.

Dark Green on Cotton Yarn.

Direct Green No. 235 on 100 pounds cotton yarn.

Prepare the dye bath with

25 lbs. of Common Salt.

3 lbs. Direct Green No. 235.

(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

Enter the material at 160° F., bring slowly to the boil and dye at this temperature for one hour.

Direct Green No. 235 is applicable to wool, and union goods by the same method, and the shades are perfectly fast to milling.

Recipe No. 51.

Scarlet on Worsted Yarn.

Crocein Scarlet R No. 13,670 on 100 pounds of worsted yarn.

Prepare the dye bath with

4 lbs. of Sulphuric Acid.

10 lbs. of Sodium Sulphate.

3 lbs. of Crocein Scarlet No. 13,670.

(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

Enter the yarn at 170° F., bring slowly to a boil and dye at this temperature for one hour, exhausting the bath if possible. It is well not to add the sulphuric acid all at once, but in several additions.

Crocein Scarlet No. 13,670 has excellent coloring power and possesses the other qualities necessary for a good dyestuff of this class.

Recipe No. 52.

Black on Cotton Yarn.

Zambesi Black B R on 100 pounds cotton yarn.

Prepare dye bath with

6 lbs. Zambesi Black B R.

(Berlin Aniline Works, 72 Front St., New York.)

20 lbs. Glauber's Salt.

2 lbs. Soda Crystals.

Dye at a boil for one hour.

(In a standing bath 4 pounds of coloring matter and 5 pounds Glauber's Salt will be sufficient.)

After well rinsing (best in an acidulated bath), enter the dyeings into the cold diazotizing bath made up as follows:

3 lbs. Nitrite of Soda (previously dissolved).

12 lbs. Hydrochloric Acid.

(On further employment of the diazotizing bath, ½ the given quantities of nitrite of soda will suffice for every 100 pounds of cotton.)

Work for about 15 minutes in this bath, and enter immediately into the cold developing bath, made up with

¾ lb. Meta Toluene Diamine, and about 1½ lbs. Soda Crystals.

(On further employment of the developing bath, about ¾ the given quantities will suffice for every 100 pounds of cotton.)

Work there for about 15 minutes, rinse, soap, if desired, and dry.

Zambesi Black B R will be found to give a great intensity at a low cost. Toluene Diamine gives a full jet black, but if Beta Naphthol be used as a developer, blue blacks are obtained, and with Resorcin a greenish black. (See recipes 192, December, and 28, February.)

Recipe No. 53.

Brown on Cotton Yarn.

Direct Brown No. 9404 B on 100 pounds of cotton cloth.

Prepare dye bath with

3 lbs. Direct Brown No. 9404 B.
(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)

20 lbs. Common Salt.

Enter yarn at 180° F., and while turning raise to the boil and continue the boiling for one hour. Wash and dry.

Direct Brown No. 9404 B gives one of the fullest shades of brown, and one which is very fast to light and washing. The dyed material may be subjected to an after treatment with bluestone.

Recipe No. 54.

Compound Shade on Worsted Yarn.

Compound shade on 100 pounds of worsted yarn.

Prepare dye bath with

2 lbs. 2 oz. New Azo Green B.

14 oz. Sulfazon Blue R.
(C. Bischoff & Co., 87 Park Place, New York.)

10 lbs. Glauber's Salt.

Enter the material at about 180°-190° F., bring to a boil, and dye at this temperature, gradually adding

15 lbs. Acetic Acid

to exhaust bath.

When the dyeing is completed the material is after treated for one-half hour in a bath containing

2 lbs. Potassium Dichromate.

These dyestuffs have a high coloring power, and produce shades whose fastness to light, fulling, alkali, acid, steaming and sulphur is very good.

Recipe No. 55.

Greenish Gray on Worsted Yarn.

Azo Acid Green B on 100 pounds of worsted yarn.

Prepare the dye bath with

¼ lb. Azo Acid Green B.
(C. Bischoff & Co., 87 Park Place, New York.)

1 lb. Acetic Acid.

2½ lbs. Glauber's Salt.

Enter at 180°-190°, bring to a boil and dye at this temperature for at least one hour.

Azo Acid Green B has a high coloring power and its fastness to light, fulling, alkali, acid, sulphur, etc., is very good.

Recipe No. 56.

Tan on Cotton Hosiery.

Direct Medium Tan No. 3038 on 100 pounds of cotton hosiery.

Prepare dye bath with

20 lbs. Common Salt.

½ lb. Soda Ash.

3 lbs. Direct Medium Tan.
(A. Klipstein & Co., 122 Pearl St., New York.)

Enter at 150°, bring to a boil, and dye at this temperature for one hour.

Direct Medium Tan is very fast to washing and will not rub off.

Recipe No. 57.

Red on Worsted Yarn.

Phenylene Red B on 100 pounds of worsted yarn.

Prepare the dye bath with

1½ lbs. Sulphuric Acid (added gradually).

3 lbs. Acetic Acid (added gradually).

2 lbs. Phenylene Red B.
(Sykes & Street, 85 Water St., New York.)

Enter the yarn at 180° F., bring to the boil and dye at this temperature for three-quarters of an hour, or until the bath is exhausted.

Phenylene Red B produces shades very fast to light, acid, alkalies, and

fulling, on wool, and on silk quite as fast as the ordinary acid colors. It possesses a remarkable resistance to light. (See recipe No. 62, this issue.)

Recipe No. 58.

Blue on Worsted Yarn.

Wool Blue B B on 100 pounds worsted yarn.

Prepare dye bath with

1½ lbs. Wool Blue B B.

(Berlin Aniline Works, 72 Front St., New York.)

25 lbs. Common Salt.

Enter at 180° F., bring to a boil, and dye at this temperature for one hour. Wash and dry.

Wool Blue B B is useful in the dyeing of union goods of wool and cotton, as it leaves the cotton undyed. It yields very brilliant, pure shades on wool, and is exceedingly well suited for combining with such substantive colors as Zambesi Blue, Columbia Fast Blue, Congo Fast Blue, Columbia Black, etc.

Recipe No. 59.

Cardinal Red on Mercerized Cotton Yarn.

Trona Red 7 B on 100 pounds cotton yarn.

Prepare dye bath with

6 lbs. Trona Red 7 B.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

Dissolved with 4½ pounds solid caustic soda (dissolved in water, or 11 pints of soda lye 76 Deg. Tw.), and a sufficient quantity of boiling water with constant stirring. This hot solution is then added to the dye bath containing

150-200 gallons water.

100-150 lbs. Common Salt.

Enter the yarn at boil, shut off steam and work for ¾ of an hour just under the boiling point, then lift the goods, hydro extract well, but do not rinse, and then work for a short time in a cold solution of one per cent. sulphuric acid (1 lb. sulphuric acid per 10 gallons) and then rinse thoroughly in cold water. As the bath is not exhausted, it may be preserved for further use, when the quantity of color as soda lye should be diminished one-third. The quantity of salt added depends upon the amount of liquor removed from the bath with the cloth.

Trona Red 7 B is characterized by the fastness to dilute mineral acids and organic acids, and its great clearness of shade. The shade is turned slightly yellower with warm alkalies, but cold dilute acid restores it. Trona Red 7 B may also be dyed on wool, either with acetic acid or dilute cold mineral acids. [See recipes 25 (Feb.) and 38 (March.)]

Recipe No. 60.

Greenish or Turquoise Blue.

Cyanole Green B on 100 pounds worsted yarn.

Prepare the dye bath with

15 lbs. Glauber's Salt.

10 lbs. Sodium Bisulphate.

½ lb. Cyanole Green B.

(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

Enter yarn at 180° F., bring to a boil and dye at this temperature for one hour, exhausting the bath if possible.

Cyanole Green B produces a shade commonly known as Turquoise Blue, and possesses excellent qualities.

Recipe No. 61.

Medium Tan on Cotton Hosiery.

Diphenyl Catechin B on 100 pounds of cotton hosiery.

Prepare dye bath with

25 lbs. Common Salt.

1 lb. Diphenyl Catechin B.

(John J. Keller & Co., 104-106 Murray St., New York.)

Enter material at 180° F., bring slowly to a boil and dye at this temperature for one hour.

Diphenyl Catechin B is valuable in the production of tans.

Recipe No. 62.

Reddish Violet on Worsted Yarn.

Phenylene Violet R on 100 lbs. worsted yarn.

Prepare the dye bath with

1½ lbs. Sulphuric Acid—added gradually.

or

3 lbs. Acetic Acid—added gradually.

2 lbs. Phenylene Violet R.

(Sykes & Street, 85 Water St., New York.)

Enter the yarn at 180° F., bring to a boil and dye at this temperature for ¾ hour, or until exhausted.

Phenylene Violet R produces shades very fast to acids, alkalies, fulling, and light, on wool, and quite as fast on silk as ordinary acid colors. It possesses a remarkable resistance to light. (See recipe 57, this issue.)

Recipe No. 63.

Maroon on Cotton Yarn.

Maroon R B on 100 pounds of cotton yarn.

Prepare the dye bath with

20 lbs. Common Salt.

3 lbs. Maroon R B.

(Anchor Color Manufacturing Co., 462 Cherry St., New York City.)

Enter yarn at 170° F., bring slowly to a boil and dye at this temperature for one hour to 1¼ hours.

Maroon R B gives a very fast and desirable color, and can be used as above directed on wool as well as cotton.

Recipe No. 64.

Tan on Cotton Hosiery.

Tan R on 100 pounds of cotton hosiery.

Prepare the dye bath with

25 lbs. Salt.

2 lbs. Tan R.

(New York & Boston Dyewood Co., 55 Beekman St., New York.)

Enter material at 150°, bring slowly to a boil, and dye at this temperature for one hour.

Tan R is recommended for use in the production of tans on stocking hosiery.

—The date 1834 deserves special mention, a year in which stretching frames, scouring salts, and Perrot's machine (the perrotine), so excellent for reserve printing, were invented.

Artificial Indigo.

About the middle of 1897, an event took place which caused a profound sensation in the dyeing and printing trade, which is becoming to all connected with the indigo industry a matter of vast importance, the magnitude of which no one can yet foresee, viz., the introduction into commerce of what is known as artificial indigo, made from coal tar. A great many statements concerning this product give false impressions regarding its nature and usefulness, and the likelihood of its becoming a serious rival of the natural product. It is now generally, and almost universally, admitted by chemists and dyers of repute that artificial synthetic indigo will have a very serious effect on the natural indigo trade.

In reference to the production of artificial indigo, Dr. H. E. Armstrong, of the Central Technical College, So. Kensington, England, has written a communication to the London Times, as follows:

"It should be clearly understood that it is no question of introducing a substitute for 'real indigo,' if by this is meant the blue coloring matter in commercial indigo, but of using a substance identical with that produced by nature, and differing from it only by being 'made in Germany'—of using an article differing only from that produced in India (apart from the presence of indigo red in the latter) by being of superior quality owing to its freedom from the foreign matters often present to a considerable extent in commercial natural indigo. Unless these impurities play an important part in the dyeing process—and this is improbable—the artificial product should be at least as good a dye in all respects as the natural indigo.

"I am told that artificial indigo does not lend itself to the dyer's use quite so readily as the natural product. Indigo, properly speaking, is not a dyestuff, but an insoluble pigment. To dye with it the blue must first be con-

verted into soluble indigo white. It is said that the artificial substance is not quite so easily reduced to white as is the natural product; but this involves no real distinction. Crystalline substances are often less amenable to treatment than are amorphous ones, and probably little difficulty will be experienced in making artificial indigo just as easy to treat as that from any natural source.

"No reliance can be placed on a rise in price of crude materials. There should be no difficulty in increasing the production of naphthelene and toluene, should a demand arise; enormous quantities of tar are now allowed to go to waste in coking coal.

"The stake for which the German chemical manufacturer is playing is a very big one—far bigger than was offered by madder 30 years ago. Indigo is more difficult to make than is alizarin, but such is the persistence of the German attack upon the position, and so great is the improvement in our methods, that it is far from improbable that all difficulties will ere long be overcome. The manner in which the German factories are organized for such work is marvellous, and calculated to excite the admiration and envy of all who can understand it. I have been astonished at the progress made only in the course of two or three years since I was last in the Rhine district. Thus one firm I find has a scientific staff of 110 skilled chemists, whilst that of another has risen to no fewer than 150, and the works are in proportion. Nature has no chance in the long run against such odds."

Artificial indigo has been known to the chemist for some time, but not to the dyer, as a commercial product competing with the natural. The indigo known up to the middle of 1897 was a natural vegetable product, and is not only the oldest coloring matter known, but has also been looked upon from ancient times as the most important of all colors. The sensation caused by the introduction of the commercial, artificially made product is, therefore, easily comprehensible.

Prof. A. Schmidt, in a paper read about a year ago at the Technical College, Bradford, England, alluded to the history of the artificial indigo as follows:

"In 1881, Professor V. Bayer first succeeded in finding out the real chemical composition of indigo, and soon afterwards showed us the way how to build up indigo synthetically from its component parts. Bayer's name will thus remain inseparably connected with the synthesis of indigo. According to him, the raw material used is cinnamic acid, which is contained in the cinnamon, one of the most important commercial products of those countries, which also supply us with indigo. To make cinnamic acid from cinnamon bark was out of the question, simply because it is dearer than indigo. Bayer's discovery therefore would not have been of any practical value, had it not been for the fact that at that time a method was already known how to make cinnamic acid much cheaper from coal-tar. The largest color works in the world, namely, the Badische Anilin & Soda Fabric at Ludwigshafen, bought Bayer's invention, and commenced without delay to make a practical study of it. Then, after years of costly and difficult experiments, it was unfortunately found that it was impossible to produce indigo on a large scale by this method, on account of the following defect. In order to gain indigo from cinnamic acid, the latter must first of all be turned into nitro-cinnamic acid by treating it with nitric acid. In doing so, there are two kinds of the nitro-compound formed at the same time, called ortho and para-nitro-cinnamic acid, of which after Bayer's method the former only can be used for making indigo, and the yield of the ortho-compound being too small in proportion to the useless para-compound, this method was too dear.

"Still the research work did not rest, and a new impulse was given when the late Professor Heumann, of

Zurich, in 1890, discovered another more promising method for making indigo, which, after undergoing some alterations and modifications, assisted materially in the final success. Heumann based his theory on a substance which was easier to make, namely the phenyl-glycocol carboxylic acid, but this process again offered great difficulties in practice, although it was the means of bringing into commerce an indigo compound called indoxylic acid, under the name of indophor, suitable for printing cotton and other vegetable fibre, yet this was not the indigo itself. A solution of this acid has the property of decomposing into indigo, when coming into contact with the air. In printing, this precipitation of indigo on to the fibre takes place when the pieces are steamed.

"After surmounting of apparently endless difficulties, both as regards chemical and technical work and machinery, the Badische finally succeeded in making a product which is the real indigo itself in its purest form.

"In July, 1897, this synthetic indigo was brought into the market, under the name of indigo pure B. A. S. F., at a price capable of competing with the natural indigo. The long-striven-for object was now attained at last. The credit, therefore, for having made the artificial indigo a commercial product is due to the Badische.

"The process by which this firm is manufacturing their indigo at present is a secret of their own. However, it has become an accomplished fact that since 1897 natural indigo has found a very formidable competitor in the artificial product. The struggle between the two indigoes has already commenced, and as to the ultimate issue there can be scarcely any doubt, because the history of the chemical industry has already taught us in numerous cases that the perfection of industrial processes progresses more rapidly than any proportionate cheapening of natural plant cultivation can be effected.

"At equal prices the artificial indigo will always have the preference, being a pure product, and delivered in a uniform quality. At present the opinion as to the value of the new indigo still varies a great deal, simply because the color has not been in the market sufficiently long. The discussion in technical journals between experts is continually going on. Although it is now generally admitted that the indigo of the Badische is real indigo, yet there are still a few people under the impression that the Badische indigo is derived from the natural plants. This assertion is of course without any foundation in fact. Some people consider the impurities of the natural indigo as of great importance, whilst others do not value them at all.

"However, the final development of the indigo question will not be influenced by such discussions, some of them being, no doubt, based to a great extent on personal interests. Facts alone will decide, which the dyer will recognize in due course.

"I should like here to mention that the difference between the names of vegetable or natural indigo and synthetical or artificial indigo do not imply any difference in the ultimate composition or properties, but merely indicates what the indigo is made from. Indigo is always indigo, may it be made from the plant or from coal tar. The artificial product is not a substitute, but is the real indigo, just the same as silver is always silver, may it be found in an almost pure state in Nevada, or gained by extracting it from ore in Wales."

The Carpet Industry.

The carpet industry has a most interesting history. Carpets were first used in the East and there the industry originated. The domestic customs of the Eastern people, their mode of sitting or reclining upon the floor, instead of, as we do, upon chairs or couches raised above it, made it necessary for some kind of covering upon the floor. The open air life of the

Eastern people had also much to do with the introduction of carpets. In the East great importance was early attached to carpet. In the Arabian Nights we see magical powers attributed to it, and to the wonders of fairyland, it was what the railroad and telegraph are to this modern day.

Among the Egyptians, the Babylonians and Assyrians, the use of embroidered carpets was equally as common. These nations carried the art to a high degree of perfection. Among the Hebrews, carpets and hangings were in frequent use. Throughout the Bible we find many references to carpets and according to the descriptions of the hangings of the tabernacle, they were of great splendor. In Greece, the use of carpets for covering the floors is mentioned by Homer. The web of embroidery which Penelope was engaged on every day, and raveled every night, so as to keep the suitors for her hand at bay until the return of her faithful Ulysses, was intended for some sort of floor decoration.

In Europe, the use of carpets is of comparatively recent date. In modern times the improved machinery has greatly cheapened the cost of their manufacture. In France, the manufacture of carpets was begun in the reign of Henry IV., but the first attempt was not entirely successful. In 1664, Colbert, the great minister of Louis XIV., to whose personal efforts France was indebted for the introduction of many of her industries, established a carpet factory at Beauvais, a town forty miles northwest of Paris, and there to this day the industry is still flourishing.

In the United States, it is traditionally reported that the first piece of carpet ever used in a private house was one found in that of Captain Kidd, the noted pirate. As early as 1760, Scotch and other carpets were offered for sale in New York, but until some time after the Revolution the use of carpets in this country was very limited. Before that time, however, home-made carpets were being manufactured. This industry grew rapidly and soon looms were set up in all the colonies. At one time nearly every farmer owned a loom which was used for weaving cloth as well as carpets.

In 1791, Alexander Hamilton recommended the placing of a tariff upon imported carpets, which was done. This much encouraged the infant industry in this country. The census of 1810 puts the carpet output at 9984 yards. Of this, 7501 yards were made in Philadelphia, at a valuation of about $1.50 per yard, and 750 yards in Hartford County, Maryland, at about $3.00 per yard.

Up to this time, however, the weaving of carpets, both in this country and in England, was done by hand. But before this time American inventive genius had been turned toward improving the looms in use, and by 1840 several patents for improvements had been granted. However, these were not of any great benefit to the industry. The problem of making a power loom which should automatically perform so difficult a work as to weave a two-ply web, so as to produce any desired pattern, had in England long been abandoned as insoluble. It was solved, however, by Erastus B. Bigelow, of Massachusetts, who also invented a loom for the manufacture of Brussels carpets. Patents for this improved loom were granted in 1845. By the introduction of these looms the production of carpets was greatly cheapened, and the industry at once became a most important one. Ever since that time the industry has flourished, and with the improvement in machinery we have been enabled to keep pace with the manufacturers of other countries, and of late years have been forging rapidly to the front.

—According to the latest researches of Ranke and Schrader, woad was known as a coloring matter by the Indo-Germanic races of the stone age, and we conclude that they had this knowledge brought over with them from India.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Peruvian Cotton, Etc.

Editor Textile World:

We desire information regarding Peruvian cotton, the grades that are known in the market and the ones most free from foreign substances. Can you obtain for us a copy of the wool book published by the National Association of Wool Manufacturers?

E. R. W.

There are only two grades known in the market, of Peruvian cotton, namely, the rough and smooth. The first is the only grade that is imported into this country, and is used exclusively for mixing with wool, which it resembles in many particulars. This grade is obtained from the species known as the Gossypium Peruvianum, is perennial, and grows on a tree from ten to fifteen feet high. The smooth variety has its origin from seeds obtained from the United States, which were introduced into Peru a great many years ago. All of this grade goes to Europe, and is used in the manufacture of cotton fabrics.

In regard to a copy of the wool book published by the National Association of Manufacturers, the last edition was printed a number of years ago. A new edition is in preparation. We would suggest writing to the secretary of this association, 70 Kilby Street, Boston, for any information concerning this book.

Recipe for Tan Shade on Cotton Hosiery.

Editor Textile World:

Will you please give me a recipe for dyeing a medium shade of tan on cotton hosiery?

V. P.

We have replied by mail. It is difficult to give a recipe or definite directions for dyeing tan upon cotton without knowing all of the particulars concerning the wants of the manufacturer. There are so many different grades of cotton hosiery that the directions naturally vary in order to meet the requirement of conditions. We expect to display in our Dyers' Supplement specimens of hosiery dyed to different shades of tan. Those interested in this color should keep track of our Supplements as they are issued.

Welborn's Cotton.

Editor Textile World:

Will you be so kind as to tell me the length of staple of Jeff Welborn's "perfection" cotton; also, how it compares with Sea Island in length and price per pound. Is it to be found on the market? I am examining into the merits of this new cotton, with the expectation of taking hold of it this season.

C. L. E.

We suppose that our correspondent refers to Jeff Welborn's "pet" cotton, which is said to be the progenitor of the cotton that has been so greatly advertised as Jackson's "Limbless" cotton. Mr. Welborn's cotton has a well defined genealogy, extending back into slavery times. It has been brought to its present perfection by careful selection and cultivation. Its staple is from 1⅛ to 1¼ inches long, and compares favorably with the Peeler variety. We do not know, however, that it is to be found in the market separate from any of the bottom-land cottons raised in the valleys of the Mississippi and its tributaries. Quite as important as the length of staple of this cotton is its yield per acre, though all of these favorable features depend upon careful selection of seed from season to season and careful methods of cultivation upon suitable soil. The price of this cotton, we should say, ought to be ¼ to ½ cent above the quotations of upland cotton.

Absorbent Cotton.

Editor Textile World:

Can you advise us what is the process for making absorbent cotton?

H. F. M.

We answered a similar inquiry very fully in our April, 1899, issue, to which we refer.

Vanadium.

Editor Textile World:

Will you advise me regarding the use of Vanadic Acid as a mordant in setting fast blacks in aniline dyeing? Any literature or reference on the subject will be greatly appreciated.

B. F. A.

Vanadium is one of the elements, and belongs to the antimony group. It was discovered in 1830. It is an extremely rare substance, forming an essential constituent of only a few scarce minerals. We speak of this because of a certain portion of our correspondent's letter not included in the inquiry. Vanadate of Ammonia is the salt purchased for use in preparing aniline black, but before it can be used it is necessary to prepare an acid solution of it and to reduce it with glycerine. Vanadium is one of the most costly elements in existence, costing somewhere between $4000 and $5000 per pound. The stock colors made in the color shop are usually prepared without one of the necessary ingredients, in order that they may be kept for some time after preparation; the colors, as required, are finished by the addition of the omitted chemical. The length of time required to age the black printed from some of the recipes used for the printing of cotton fabrics quite unfits them for use along with colors which must be finished immediately, or very soon after printing; for example, when a black is required along with discharge colors upon indigo dyed cloth, etc. By the use of a Vanadium solution a color can be made which will fully age or develop in a few hours, and a color so prepared is used in all cases requiring quick ageing. The Vanadium solution will, if required, act as a carrier of oxygen from the chlorate to the aniline salt without the use of any other carrier. We would refer our correspondent to the Printing of Cotton Fabrics, by Sansone; Treatise on Chemistry, by Roscoe & Schorlemmer, and Manual of Qualitative Chemical Analysis, by Dr. C. R. Fresenius, and other standard books of like character.

Ramie.

Editor Textile World:

Will you advise me where ramie is grown, the principal market, and marketable price?

I. N. G.

We cannot give the price of ramie in any of our American markets, as not sufficient quantity of it is sold to make it an object of quotation in trade circulars. This fibre is indigenous to China, India and other Asiatic countries, but it is capable of cultivation in many portions of the United States. Our correspondent probably can get an abundance of information concerning this fibre by addressing the Secretary of the Department of Agriculture, Washington. In a general way, it may be said that the ramie plant requires a hot, moist climate with no extremes of temperature, and a naturally rich, damp, but never wet, soil, the necessary moisture to be supplied by frequent rains or by irrigation. In other words, such a climate and soil that when the growing season is commenced the growth will be rapid and continuous. The best localities in the United States, as experience has determined, are portions of Florida, Mississippi, Louisiana and Texas, on the Gulf, and central California on the Pacific coast. There is no great difficulty experienced in the use of ramie fibre in the manufacture of textiles. The greatest difficulty is in the preparation, upon a commercial basis, of the fibre itself, as a raw material, for manufacture. It is used for upholstery, curtains, laces, table damask, napkins, sail duck, etc., etc. If our correspondent wishes to go into this matter more thoroughly, we would refer him to the Report on the Ramie Fibre by Watson; Spon's Encyclopedia; Reports I, II, and VII, Fibre Investigation Series, U. S. Dept. of Agriculture; and, in addition to these there are a number of French publications on this subject.

Woolen Spindles in the United States.

Editor Textile World:

Can you inform me how many woolen and merino spindles there are operated in the United States and Canada respectively. We do not find mention of the total number in your Textile Directory.

Pratt.

There is no way of giving the number of spindles in Canadian mills. In the United States there are in the neighborhood of 2,550,000. We base this on the estimate of 8500 sets of woolen cards in the United States, to which we give the average number of 300 spindles to a set. According to the 1890 census, the average number of spindles per set was 296.

Insurance Companies.

Editor Textile World:

A few days ago, while a member of the State police was inspecting our plant, he remarked that he understood that the factory mutual fire insurance companies were talking of insuring mill owners against loss by accident from defective machinery, or otherwise. Can you give us any information on the subject?

N. S. C.

It has been suggested to the mutual fire insurance companies that they issue accident policies of this kind, but it has been considered as being outside of their proper functions, and, therefore, they have refused to do so, believing that the two lines are totally inconsistent. In order to meet the demand of this nature, there has been formed the American Mutual Liability Insurance Company, Bos-

ton, which issues accident policies, such as our correspondent inquires about.

New Thing in Knitting.

Editor Textile World:

Will you kindly put us in communication with parties who are manufacturing "a new thing in knitting, referred to in your March number?"

W. I. L.

If our correspondent will write to the American Knitting Machine Company, Providence, R. I., he may obtain the necessary information.

Rule for Finding Twist Gear.

Editor Textile World:

Can you inform me of a short rule to find the proper twist gear to put on a Biddeford roving frame, when changing from one hank roving to another?

C. H. W.

There is a general rule that applies to all frames, of whatever make, and is as follows: Multiply the square root of the hank roving being made by the number of teeth in the twist change gear, and divide this product by the square root of the hank roving required; the quotient will be the number of teeth in the required twist change gear; or, in the form of an equation.

The square root of Hank Roving × Twist Change Gear ÷ the square root of Required Hank Roving = Twist Change Gear Required.

If a still shorter method of finding the proper twist gear on the Biddeford frame for any hank roving is required, we can only refer to the roving-frame catalogue of the makers, where there are tables for all sizes of frames and for any roving, together with an extended table of square roots, by the use of which, together with the rule given above, any possible twist gear or twist per inch may be readily found for standard twist.

Polishing Machine Wanted.

Editor Textile World:

Can you inform me who manufactures a polishing or glazing machine to put a glazed finish on shoe thread or corset laces after dyeing?

S. V.

We are under the impression that this polish is put on by the two or three manufacturers who make such goods by their own secret process. If any of our readers build a machine for the purpose, we should be glad to put them in correspondence with our inquirer.

Cost of Shirt Factory.

Editor Textile World:

I am thinking of starting a shirt factory of about 25 machines to make men's cotton shirts with linen bosoms. Can you tell me about what the machinery would cost and how much power it would require?

Duke.

The stitching or sewing machines would cost, approximately, $20 per head, and $8 for tabling, which includes shafting and all equipment ready to run. This would make the stitching machines, with the tabling and shafting, cost $700. You would also need a button-hole machine, which would cost $150, and tabling $8, and a button sewing machine, $125; tabling, $8. About 2 H. P. would be required to run this plant. We should advise electric power or a gas engine for such a small plant.

New Publications.

Arithmetic of the Steam Engine. By E. Sherman Gould. New York: D. Van Nostrand & Company. Price $1. This is written by a member of the American Society of Civil Engineers, and the object of the work is to furnish a clear and concise digest of the fundamental principles of the steam engine and the practical calculations based upon them.

The Use of the Slide Rule. By F. A. Halsey. New York: D. Van Nostrand & Co. Price 50 cents. The author of this book, which is a reprint mainly of a series of articles which originally appeared in that publication, is the associate editor of the American Machinist. The author intends it more as an instruction book than a treatise. It is fully illustrated, and takes up such subjects as Multiplication; Finding the Decimal Point; Division; Squares and Square Root; The Area of Circles, etc.

Mechanical Engineer's Pocket Book. Edited by William H. Fowler. New York: D. Van Nostrand & Company. Price $1. This book contains a number of notes relating to textile machinery, furnishing information which proves troublesome to find when wanted. It deals largely with electrical matters, and other things pertaining to mill engineering.

Packings. This is the title of an illustrated catalogue of packings, valves, gaskets and diaphragms, issued by the Boston Belting Company, Boston, Mass. All of the various packings, etc., described in this catalogue possess the merit of having satisfactorily stood the test of time. The majority of them have been on the market for many years, during which their uniform quality and reliability have become widely and favorably known.

The Garden Hose. This is the title of a trade catalogue issued by the Boston Belting Company, Boston, Mass., and relates particularly to cotton and rubber cotton hose, couplings, nozzles, sprinklers, reels, etc.

Power Loom Weaving. By Anton Gruner of the Imperial Royal Weaving School at Asch. Scott, Greenwood & Co., London. Price $3.00. This is a work of 147 pages, in which the subject is treated in a clear, attractive style. The various types of continental, English and American looms, their construction and operation, are explained. Much valuable information is given on Dobby and Jacquard weaving. The various loom box motions are described. The author has succeeded in his aim to present the subject in a clear, concise manner, and the book will prove valuable to all interested in the subject of power-loom weaving. A section of the work is devoted to the explanation of the numerous European systems of numbering cotton, woolen, worsted, silk and linen yarn. Comparative yarn tables are given, together with many rules for calculating warp and filling weights, reed space, speed, picks, etc.

Electric Wiring. By Cecil P. Poole. New York: The Power Publishing Company. Price $1. This effort on the part of the author is to explain the computation to the uninitiated, and to present in shape for convenient reference, tables and formulas for the use of competent engineers. Wiring tables for alternating-current motors are included; also, tables showing the corrected drop in inductive circuits. These are claimed to be the only tables of the kind, and they should prove of value.

Political Science Quarterly. The March number of this publication, edited by the faculty of Political Science of Columbia University, New York, has just come to hand, with the following contents: A Southern Mill Town; Prices and Individual Warfare; Government Regulation of Railways; State Administration in New York; Value of Political Philosophy; Are Legal-Tender Laws ex post facto? Patten's Study of English Thought.

Dyestuffs. This is the title of Vol. II of a monthly publication issued by Wm. J. Matheson & Company, Ltd., New York, and covers the year 1899. The publication is confined chiefly to the dyes that are operated in by the publishers.

One-Dip Dyeing on Slubbing, Fast to Light and Milling. This is the subject of a color card issued by Wm. J. Matheson & Company, Ltd., New York, and relates to dyeings on wool.

Diamine Colors on Union Hosiery is the subject of a color card issued by Wm. J. Matheson & Company, New York, which knitters should send for, especially those that make colored goods.

Generating Sets, with Automatic Horizontal and Upright Engines. This is the subject of Bulletin G, third edition, issued by the B. F. Sturtevant Company, Boston, Mass., handsomely illustrated and descriptive of direct connected 4-pole generators, direct connected 8-pole generators, etc.

Perforated Sheet Metal. We have received from Fraser & Chalmers of Chicago, their No. 7 catalogue, devoted to the subject of perforated sheet metal. This catalogue covers the subject in a most complete way, and gives all the information that anyone interested would want to know. It is difficult to enumerate all the uses of perforated metal, but in connection with textile machinery, particularly in washing and extracting machines, it is extensively employed. The catalogue is illustrated with plates showing the exact size and style of perforations, which is a valuable guide to those wishing to order. Perforations are made in a great variety of shapes, each having their special advantage. Fraser & Chalmers are very large machine builders. They have a high reputation for responsibility. Their catalogue will be sent to interested parties on request.

Sederholm Boilers. We have received from Fraser & Chalmers of Chicago, an illustrated catalogue descriptive of the Sederholm boilers, which are especially intended for high pressure and large units. This boiler is designed to permit high pressures and yet retain the advantages of the standard, horizontal, return-fire tubular boiler. The catalogue shows clearly the features of advantage possessed by this type, and presents illustrations of various installations. Besides that it contains valuable tables of reference value for steam users.

Properties and Application of Dyes. The Berlin Aniline Works, New York, have just issued a book of 267 pages relating to the coloring matters sold by them, giving their properties and application to the dyeing of textile fabrics. The properties of the dyes represented are compiled in comparative tables; and the methods of dyeing are also given in tabulated form. The book is a short and comprehensive guide for the application of coloring matters sold by this concern. The book takes up such subjects as Dyeing of Wool, Silk, Cotton, Linen, Ramie, etc.

Industrial News.

Persons Seeking Homes.

Persons seeking homes or investments, or firms and corporations seeking locations in the South and who desire information about Tennessee would do well to address Robert Gates, special industrial and immigration agent, Louisville & Nashville R. R. for Tennessee, at Nashville, Tenn.

—The efficiency of the Sturtevant exhaust head is emphatically shown by the following letter received by the B. F. Sturtevant Co. of Boston, from the Frost & Wood Co., of Smith's Falls, Ont. It reads: "Allow us to add that we have never paid with greater satisfaction an account for an article of this description, than we pay for your exhaust steam head. It has given us every satisfaction, and we would not be without it for several times what it cost. It should prove invaluable to steam users in a cold climate. Previous to using this we were very greatly bothered with an accumulation of ice from the exhaust spray. This has now been entirely overcome."

Looking for a Location.

The States Chemical Co., whose Boston office is 36 Central Wharf, are looking for

a suitable location for a new plant which they propose to erect for the manufacture of bleaching powder and caustic soda. Good shipping facilities and a large water power are necessary. Bosson & Lane are the selling agents.

—The Berlin Iron Bridge Company, of East Berlin, Conn., have received through a large Philadelphia exporting house the contract for eleven plate girder bridges, to be sent to foreign parts.

Steam Plants.

Attention is called to the advertisement of Walter Pendleton & Co., 13 to 21 Park Row, New York. This firm are agents for the Bovaird & Seyfang Mfg. Co. of Bradford, Pa., builders of steam and gas engines, and also for the Stewart Heater Co., Buffalo, N. Y., manufacturers of the Otis feed water heaters and steam and belt pumps, and for the "Superior" patented boilers. They also handle all auxiliary steam appliances necessary for installing complete boiler and steam plants. Mr. Pendleton of this firm is an expert in this line, and is prepared to give intelligent advice and estimates upon matters bearing upon this department of factory work.

From Yokohama.

The Burt Mfg. Co., of Akron, Ohio, manufacturers of the Cross Oil Filter, have just received one of the largest orders of the year from Yokohama, Japan. This concern say they have already broken their record for business as compared with the early months of previous years.

The Lehigh Valley Coal Co. have just sent in an order for nine and The American Tin Plate Co., their twelfth order.

Extra Time.

The New York Blower Co., which has lately taken possession of its commodious new shops at Bucyrus, Ohio, has been successful in landing a number of generous orders which are keeping the works busy not only on full time, but makes extra men and extra hours necessary. The company has put out some excellent work, which is proving so satisfactory that other orders have been placed with them in consequence.

600,000 H. P.

This is a formidable figure and represents the sum total of a list of some of the users of the American feed water heaters contained in a little pamphlet which the Whitlock Coil Pipe Co. of Elmwood, Conn., has issued on the subject. They have prepared special booklets, each treating on some specific point and each containing interesting information on the subject of feed water heaters and pipe coils and bends. Their special machinery permits them to fill all sorts of orders in this sort of work. Almost all coil work is made to order from specifications, and such being the case, standard price-lists are impracticable, but the booklet which they issue on this subject contains much information that would be of value and also suggests advantageous uses of coils and bends which may not have occurred to some.

$35 per Yard.

There is a small mill in Jersey City, N. J., which makes probably the most expensive carpets in this country. They sell for $35 per yard, and are made to order for the houses of the very rich. It is a branch of a large mill in England.

—The Berlin Iron Bridge Company of East Berlin, Conn., have increased their capital stock to $750,000.00 and have made extensive purchases of land at Pittsburgh, Pa., where they will start a branch. They have already placed the orders for the greater portion of their machinery equipment, and are now at work on the plans for the buildings, which will be quite extensive, designed and built by themselves in their own shops. It is intended that this plant shall be fully equipped with all the modern appliances for doing all classes of steel bridges and structural work, in fact, the layout promises that it will be the best plant of the kind in this country.

Well Pleased.

Cohoes, N. Y., March 8, 1900.

Mr. Geo. Smethurst, Maynard, Mass.

Dear Sir: In reply to your letter of March 6th, would say that we are well pleased so far with your Improved Twist & Roving Gears. They do the work very satisfactorily.

Yours truly,
(Signed) ROOT MFG. CO.,
Tivoli Mills.

Cotton Mill Wanted.

The town of Pittsburgh, Texas, has raised $60,000 to build a cotton mill, but none of the subscribers are practical cotton manufacturers. They are desirous of associating with them outside capital, and would like to arrange with some manufacturer or superintendent who can invest in the enterprise and take management.

—The Berlin Iron Bridge Company, of East Berlin, Conn., will open an office at rooms No. 909-910 Stephen Girard Building, Philadelphia, Pa., on the 15th. The office will be in charge of H. L. Brumbaugh, who has been with The Bridge Company for a number of years.

—The Oak Knitting Co. of Syracuse, N. Y., have got their new mill in operation in about as quick time as any on record. They put up a 4-story building, 50 by 100, and had the machines running in three months from time of starting.

Uniform Speed of Machines.

One of the great advantages which textile users of Cling-Surface say it gives is to produce uniform speed of machines. The load can be changed from zero to full speed at a single jump, without the belts slipping.

Heddles and Harness Frames.

The L. S. Watson Manufacturing Company of Leicester, Mass., have been manufacturing heddles and harness frames for so many years that they are in a position to know exactly what the trade desires and to give it to them in the best possible manner at the lowest competitive prices. Fifty-eight years in any line of business is the best evidence that a concern has made a success of its business. Their harness frames and wire heddles are used in most of the mills throughout the United States and Canada. They are made to suit every requirement, of any thickness desired, for any kind of cotton, wool and carpet loom. For fine work, especially for fine fancy cotton goods, the importance of perfect heddles, with smooth eyes, is recognized by the weaver.

A special feature of their business is the agency for the German steel tinned wire heddles, which are adapted for the finest silk and cotton work. Having their warp eyes soldered, makes them very smooth for the warp thread to pass through, and there is no chafing of the warp on account of the eye being so finely made. They are claimed to outwear the ordinary heddle.

Besides the line of goods of their own manufacture, the L. S. Watson Co. handle all sorts of loom supplies and are prepared to furnish quotations upon application. Their advertisement will be noted on another page. (See Index.)

Stops Slipping of Belts.

The Warren Liquid Pulley Cover, manufactured by the Warren Manufacturing Company, of Chicago, is a pulley paint, which is applied to the pulley with a brush, leaving that surface enameled so that it is adhesive and so leather-like that it has often been taken for a leather cover. If this is true, it is not necessary to say that this makes an admirable substitute for leather lagging which has been so extensively used on all kinds of machinery.

The Warren Mfg. Co. have just issued some very neat literature which gives full description and price of this composition, which it is said is fast coming into very general use.

—The new power house for the Pittsburgh Reduction Company at Shawenegan Falls, Province of Quebec, Canada, will be furnished by The Berlin Iron Bridge Company, of East Berlin, Conn.

Designing.

Eugene F. Freund has established a studio and office at 140 Maiden Lane, New York, and invites orders from cotton, woolen and silk dress goods manufacturers for designs. Mr. Freund is a practical cotton and silk manufacturer and designer, and has been designer for several of the leading mills, so that he thoroughly understands the practical application of designs to mill work. He also undertakes designing tie silks, ribbons, warp and surface print fabrics, upholstery, carpets, curtains, chenille, etc. We can commend his work.

Card Clothing.

The firm of Benj. Booth & Co., are doing a very large business in card clothing, which is constantly increasing. They number now among their customers some of the most particular buyers, not only in the Pennsylvania district, but all through the manufacturing states. It is an independent concern, outside any combination, and would be pleased to quote on application. The firm is composed of Messrs. Benj. Booth and Paul Lang, both of whom are practical men, with wide experience and acquaintance in the trade. Their office and factory is at 1717-1729 Bodine St., Philadelphia.

Special Sewing Machines for Manufacturers.

The Excelsior Sewing Machine Co. has recently been re-organized and Mr. W. C. Von Buchwald is now sole proprietor, having recently bought out his partner's interests. The concern makes special sewing machines for manufacturers' use, designed for all classes of work. It is sole agent for the Murphy high speed double thread trimming machine for concealed hosiery welting and underwear. They undertake all sorts of repairing and alteration of all makes of machines, and will apply fabric trimmers on different makes, as desired. Making a specialty of this class of work, they are thoroughly well posted in the requirements, and figure closely.

—The Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, report many inquiries of late for carbonizing plants. Their works are very busy. Mr. W. W. Sibson has recently been in the North and East closing up some large orders.

—H. G. McKerrow & Co. of Boston have just completed the delivery of the Tweedales & Smalley drawing frames ordered by the Vivian Cotton Mills, Cherryville, N. C.

American Aniline Colors.

The concerns most prominently identified with American aniline colors have recently been consolidated, and a new corporation, called the Schoellkopf, Hartford & Hanna Co., has been created, absorbing Schoellkopf, Hartford & Maclagan, Ltd., New York; the Schoellkopf Aniline & Chemical Co., Buffalo; the Hanna-Schoellkopf Co., Philadelphia, and the Schoellkopf Aniline & Chemical Co., Boston. The officers of the new company are J. F. Schoellkopf, Jr., president; James Hartford and W. W. Hanna, vice-presidents; C. P. Hugo Schoellkopf, treasurer; and Jesse W. Starr, 3d, secretary. The works at Buffalo were established about twenty years ago, and immense investment of capital has been made in the development of a plant which should be thoroughly up to date and whose product should rank with the foremost in the market. They employ the Nitro Benzole Process, which gives freedom from arsenic. While appealing to American manufacturers on the ground that they are such themselves, they appreciate that orders are not

placed through sentiment alone unless backed up by merit, and they are prepared to meet competition, both in price and quality, with foreign lines. The eastern headquarters are in the Woodbridge Bldg., at 100 William St., New York, and the large warehouse at 236 Water St. The Philadelphia office is at 109 North Water St., and Boston office at 163 Oliver St. Other branches are located in Chicago, Milwaukee, Cincinnati, Neenah, Wis., and Watertown, N. Y. The concern acts as selling agents for a wide range of chemicals, drugs, etc., that they do not manufacture themselves, and are prepared to execute orders and contracts for almost everything in the way of dyestuffs and chemicals required by textile establishments. Each of their offices is equipped with a complete chemical laboratory, where the matching of samples is done by experts.

—The mill people at Aragon, Ga., report that the Tweedales & Smalley fly frames there are doing the finest kind of work. H. G. McKerrow & Co. of Boston are agents for these frames.

Ring Travelers.

The Morley Button Mfg. Co., Boston, Mass., reports that the sale of their Morley Ring Travelers has greatly increased during the past year. They attribute their success in this line to the close attention they give to the process of manufacture, with the result that the Travelers are of very uniform temper. They are today selling exclusively some of the largest cotton mills in the United States.

Columbia Print Works.

This large establishment is fitted up to handle all kinds of fabrics, and they are prepared to undertake bleaching, dyeing, printing and finishing, not only of cottons and linens, but of woolen fabrics, including 3-4 and 6-4 goods and mixed cassimeres. Conveniently located for both New York and Philadelphia, their facilities for prompt and satisfactory fulfilment of work in this line are unexcelled. Their New York office is in the Lawrence Bldg., 190 West Broadway.

—H. G. McKerrow & Co. of Boston will supply Tweedales & Smalley drawing frames for the new Capps Cotton Mills of Toccoa, Ga.

Rope Transmission.

The American Manufacturing Co., 63 Wall St., New York, is, we believe, the largest manufacturer of rope in the country, and they have made a specialty of making rope for power transmission. This subject is set forth in a little book which is devoted to it and entitled "A Little Blue Book on Rope Transmission, Second Edition." The success of the first edition was so pronounced that in bringing out the second it was much enlarged and new illustrations added. We believe this book will be sent upon application.

Silk Association of America.

At the recent annual meeting of this association, the following officers were elected:

President, Albert Tilt; 1st Vice-President, Catholina Lambert; 2d Vice-President, Jacques Huber; 3d Vice-President, Milo M. Belding; Treasurer, Charles F. Homer.

Managers: Geo. C. Andreae, B. A. Armstrong, Eugene Atwood, C. L. Auger, H. W. Boettger, Frank W. Cheney, John W. Cowdin, W. E. Eaton, James M. Erskine, Ewald Fleitmann, John H. Hopper, A. G. Jennings, Bernard Loth, Geo. L. Montgomery, Russell Murray, Jerome C. Read, Arthur Ryle, William Skinner, J. Noble Stearns, Jacob Weidmann.

—H. G. McKerrow & Co. are commencing to deliver the cards and drawing frames ordered by the Thomaston Cotton Mills. This machinery is all of Tweedales & Smalley's make.

Cotton Manufacturers' Meeting.

The New England Cotton Manufacturers' Association will hold its sixty-eighth meeting in Chipman Hall, Tremont Temple Building, Boston, on Wednesday and Thursday, April 25-26.

Papers will be presented on the following subjects:

Ring Spinning.

The Height and Area Required for Chimney Draft.

Belting.

Systems of Payment on Mules.

Southern Cotton Manufacturing.

Lighting Buildings by Reflected Sunlight.

Application of Forced Draft to Stationary Boilers.

Utilization of Waste Products of Cotton Mills.

The Trade of Latin America in Cotton Goods.

Heating and Ventilating of Mills.

Cotton Mixing.

It is expected that the meeting will be attended by a number of prominent guests. The arrangement of the National Association of Manufacturers in connection with this meeting embodies an interchange of courtesies which will be agreeable to the members of both organizations.

Removed to Larger Quarters.

The Manufacturers' Supplies Co. have been compelled by the great increase in their business to remove to larger quarters at 418 Arch St., Philadelphia. They feel now that they are the best fitted and stocked establishment of any Philadelphia house in the supply line, and expect the present year will be a record-breaking one for them. Mr. C. W. Odell is the manager. They carry a full line of supplies and parts for sewing machines in connection with their other supplies.

—The entire order for fly frames for the Cooleemee Cotton Mills of Cooleemee, N. Y. has been placed with H. G. McKerrow & Co. of Boston, who are the American agents for Tweedales & Smalley.

—The Bourne Mills, Fall River, have decided to equip their great weave shed with Northrop looms, after having experimented with the looms in their old mill. The order for this mill amounts to 2000 looms. The Acushnet mills, New Bedford, Mass., will have about 1200 of these looms.

Installing the Dubois Process.

The Pond Lily Co., of New Haven, Conn., have purchased the new Dubois Sanitary Fast Black Process from Calmore & Co., patent attorneys, 501 Chestnut St., Philadelphia, and are installing new dyeing machinery preparatory to using the process on cotton hosiery and yarns on a large scale.

Blue Ridge Knitting Co., Hagerstown, Md., are building a dye house to their plant and installing a complete dyeing plant and will commence dyeing shortly with the new Dubois Sanitary Fast Black Process with the lisle finish, having purchased the process from Calmore & Co., of Philadelphia.

The following are extracts from letters received from some of those who have purchased the process:

"We have used your Sanitary Fast Black for nearly a year and do not hesitate to say it is the best black we have ever seen and the most satisfactory. While simple and easy, we obtain the very best results."—Brown Bros. & Aberle Co.

"It is equaled by no other black in the world. We have tried them all. Safest and surest and our success has been beyond anticipation, and with all it is a genuine Sanitary Fast Black."—W. C. Urner & Co.

"We have had better results and less trouble with it than any we have ever used before and highly recommend it."—Thos. Buck & Co.

"We can say without hesitation that we have had better results with it than with any other we have used in our past seven years' experience in dyeing; there is not a more simple formula on the market."—E. G. Chester Dyeing Co.

"Our goods have gained an excellent reputation since we have been using it; we think it better than the Hermsdorf or any other, and nothing we have ever put in our mills has been so satisfactory, nor do we think that we have ever made a better investment in our existence."—Mankato Mills Co.

—The Mechanic's Mills of Fall River have placed a repeat order with H. G. McKerrow & Co. of Boston for the Tweedales & Smalley speeders.

Loopers.

Thomas Kennedy of Cohoes, N. Y., has added to his regular line, the building and repairing of loopers, and informs us that the looper department, which is in charge of an experienced mechanic of many years' training, is becoming busier every day. He has recently installed new machinery for his special work, and reports business very good. Mr. Kennedy is also doing a very good business with his cutting machinery.

Cling-Surface Replacing the Niagara Power.

A story is told by the editor of the Sibley College (Cornell) Journal of Engineering. He, with others, was at the Buffalo Street Railway Power House under the leadership of Prof. Carpenter of Cornell making electrical tests. Outside it was snowing six inches every hour; an ice jam had formed in the Niagara River and the Niagara Falls power was shut off, compelling the railway company to buck the storm with power from their own engines alone, forced to top speed. The belts strained and groaned, running with great bellying sags in their non driving sides. Not a belt slipped an inch except one; that was dry, hard and shiny, with a pulley surface like glass. All the rest were full of Cling-Surface.

—The Parker Mills of Warren, R. I., have placed a third repeat order with H. G. McKerrow & Co. for Tweedales & Smalley's slubbing and fine frames.

Has Come to Stay.

When the system of giving instruction in textile manufacturing by mail was announced, there were many who felt that it was an experiment that might, or might not, prove successful, but now the American Correspondence School of Textiles is in its third year of existence, and in these three years has gained the confidence of mill men all over the country. Nor are its benefits confined to American mill men, as it has students in most of the textile manufacturing countries of the world.

The many expressions of satisfaction from mill men holding all kinds of positions prove that it has been through its experimental stage, and is now looked upon as one of the established educational institutions of the country, having right along had excellent financial support, and the confidence of its supporters.

Not only situated in New England, but in the city of New Bedford, which is the acknowledged centre of the manufacture of fine cotton goods and in the neighborhood of the leading cotton machinery builders, the school is in touch at all times with the latest improvements in mill machinery.

The Director of the School, Prof. C. P. Brooks, is known not only in the Northern and Southern Cotton Mill districts of the United States, but in Europe, and having held responsible positions in textile mills, the fact that he is at the head of the School is a guarantee of the satisfactory character of the instruction.

The instructors in the different departments of the school are practical mill men who have gained their knowledge of the processes in which they instruct by so-called "hard knocks" in the mill.

Thus the instruction imparted by the school is being found of great benefit by the many hundreds of students now taking instruction.

The great lack of facilities for obtaining books regarding American machinery has led to many men joining the school simply for the purpose of obtaining the very excellent text books printed by the school, and supplied to the students for them to study, dealing very thoroughly with American machinery, and using American expressions and names of parts and giving American methods of calculations, in this respect being the only available complete set of treatises on American textile machinery.

It is not surprising that with these advantages that the school has obtained the well deserved position that it now holds.

—The Tecumseh Mills, Fall River, Mass., have ordered their new drawing frames from Messrs. H. G. McKerrow & Co., of Boston, Mass., the American agents for Messrs. Tweedales & Smalley.

Tower & Wallace.

The firm of Tower & Wallace, architects and mill engineers, have removed from the Townsend Bldg., to the Mutual Reserve Bldg., Broadway and Duane St., New York City, where they have much larger quarters and better facilities to conduct their increasing business.

Mississippi Invites Manufactures.

"The legislature of Mississippi at its session, March 1900, passed a concurrent resolution inviting investments of foreign and domestic capital in cotton factories and other enterprises of public utility in the state. The resolution assures such forms of investment every kind of protection in the way of exemptions from taxation and unjust discrimination."

The Southern Railway lines in Mississippi include that part of its Mississippi division which runs through Alcorn and Tishomingo in the northeastern corner of the state and on which are the towns of Iuka and Corinth; the main line entering the state just east of Columbus, and passing through the cities and towns of Columbus, West Point, Moon Valley, Eupora, Winona, Greenwood, Ittabena, Moorhead, Indianola and other places and which terminates at Greenville, Mississippi, with a branch line running north from Ittabena to Webbs and south from Stoneville to Percy, and also the line entering the state east of Meridian and terminating at that city. There are prosperous cotton mills at Meridian and Columbus. One is now being built at West Point. New mills are contemplated at Winona, Greenville and numerous other points.

Along the Southern Railway in Mississippi is produced a fine grade of long staple cotton, and the Land and Industrial Department can point out excellent locations for new mills in Mississippi as well as in the other states traversed by the lines of the company.

—The Stirling Mills at Lowell have adopted Smethurst's roving gear. This makes three mills which have adopted them in Lowell, and Mr. Smethurst is constantly introducing them into new mills throughout the country. There is yet to be an instance where one which has been put in as a sample has been returned, and is usually followed by an order for entire equipment.

Silk Association.

ORGANIZATION OF STANDING COMMITTEES FOR THE ENSUING YEAR.

The newly elected Board of Managers of the Silk Association of America convened yesterday for the organization of standing committees for the year ending March 26, 1901, as follows:

Arbitration Committee—Geo. L. Montgomery, chairman; Division A, Geo. L. Montgomery; Division B, Russell Murray; Division C, W. E. Eaton; Division D, H. A. Van Liew; Division E, John E. Cowdin; Division F, A. G. Jennings; Division G, Julius Kayser; Division H, C. L. Auger; Division I, Albert Blum; Division J, Isaac A. Hall; Division K, Jacques Huber.

Complaint Committee—Arthur Ryle, chairman; Bernard Loth, John Grimshaw, Charles F. Homer and B. A. Armstrong.

Committee on Admissions—H. A. Van Liew, chairman; C. L. Auger, Wm. Skinner, Jr., James Erskine and Ernst Grund.

Committee on Revenue Laws—Jacques Huber, chairman; F. W. Cheney, Catholina Lambert, Otto Andreae, Jr., and Charles F. Homer.

Committee on Information and Statistics—Ernst Grund, chairman; Geo. Singleton, C. E. Gudebrod, Julius Kaufmann, David Valentine and Henry W. Boettger.

Legislative Committee—Gen. Joseph W. Congdon, chairman, and John H. Hopper.

Silk Conditioning Committee—M. M. Belding, Jr., H. J. Hanssen, Leon Hess, Jacques Huber, A. D. Walker, Arthur Ryle, Alfred Schiffer, Geo. Singleton and H. A. Van Liew.

Executive Committee—Albert Tilt, chairman; Catholina Lambert, Jacques Huber, Milo M. Belding and Charles F. Homer.

The Board also elected as honorary members of the association His Excellency Wu Ting Fang, Envoy Extraordinary and Minister Plenipotentiary of China; His Excellency Jutaro Komura, Envoy Extraordinary and Minister Plenipotentiary of Japan. Franklin Allen was re-elected Secretary for the ensuing year.

—The B. F. Sturtevant Co. have just issued a supplementary list of their forced and induced draft installations. It is designed to serve as a supplement to catalogue No. 108, entitled "Who Uses Mechanical Draft?" It is an imposing list, and will be sent on application.

—Massachusetts, Fall River. The Heywood Narrow Fabric Company has been incorporated with capital stock of $27,000, recently to carry on the business formerly conducted by M. Heywood and Co. John J. Heywood is president and Charles H. Durfee, treasurer.

—Massachusetts, Fall River. A syndicate headed by Treasurer Rounseville and John D. Flint, has secured the controlling interest in the Shove Mills, having purchased same from President Charles Shove and directors Edward Shove and Geo. W. Slade.

—Massachusetts, North Andover. M. T. Stevens & Sons, whom we reported last October as negotiating for the North Andover Sutton Mills, have purchased the property and are now operating it.

—Massachusetts, Readville. The American Loom Co. succeeds the Universal Loom Co. and the Readville Machine Works. It has been organized under the laws of the state of New Jersey, and will take over both properties. The officers of the company are John E. Searles, president; William C. Lovering, vice-president; H. I. Harriman, secretary, and J. Foster Searles, treasurer. For several years past the original companies have been at work perfecting an improved type of loom, which, it is now understood, is nearly ready for the market.

—Massachusetts, West Millbury. The Ramshorn Woolen Mills, formerly operated by Edwin Hoyle & Son, has been leased by Chas. E. Hoyle (the son) who will continue running the plant.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Anniston. W. A. Scarbrough has been elected president and J. T. Gardner, secretary, treasurer and general manager of the new $100,000 cotton mill to be erected at this place. Nearly $65,000 has been already subscribed toward the capital required.

—Alabama, Anniston. Arrangements are now being made for a second cotton mill to be erected at this place, at a cost of about $100,000. William Noble, John H. Noble and James Keith, Jr. are interested in the new enterprise.

—*Alabama, Anniston. We learn that Robinson Brothers, cotton merchants at this place, are contemplating building a small mill of 2500 to 5000 spindles (ring spinning). They are now looking the matter up. This is probably the same project which has been mentioned in connection with other names in previous issues.

—*Alabama, Huntsville. The contract for the addition to be erected by the Dallas Cotton Mills, to accommodate 25,000 spindles and 1200 looms, has been let to George B. Hinman, who will begin work on same at once. Contracts for about 200 new tenement houses will probably soon be awarded. It is proposed to have the addition completed, ready for operation, about the 1st of October.

—Alabama, Huntsville. The Madison Spinning Company, recently organized, will erect a 5000 spindle cotton yarn mill at this place.

—*Alabama, Opelika. C. C. Tarbet, president of the Sheaperd Bank, has been elected president of the Opelika Cotton Factory, J. R. Hardaway, general manager and M. M. McCall, secretary. Work will soon be started on the erection of the buildings. J. R. Hardaway and N. P. Renfro are in the East purchasing necessary machinery.

—*Georgia, Atlanta. S. A. Carter informs us that the new mill at this place in which he is interested, and will be president of corporation formed, will be for manufacturing hosiery yarns and will have equipment of 5,000 spindles, to be increased to 10,000 after first year. Knitting machinery will be added later.

—Georgia, Columbus. The Bibb Manufacturing Co., Macon, Ga., will build a branch mill at this place. The plant will be equipped with 20,000 spindles and 600 looms, and will manufacture high class goods exclusively.

—Georgia, Columbus. A charter has been applied for by the Southern Wadding Mill, a new enterprise in which E. N. Clemence (of the Eagle & Phoenix Mills), John C. Cook, Capt. S. P. Gilbert and C. L. Perkins are interested. As soon as a suitable site can be obtained, work will be started on erection of building.

—Georgia, Gainesville. The Pacolet (S. C.) Mfg. Co. will build a branch mill at a cost of $1,000,000, near this place. The main building will be 130x525 feet, 5 stories and equipped with 50,000 spindles. Standard sheetings will be manufactured for the China trade. Victor H. Montgomery, son of J. H. Montgomery of the Pacolet Mill is to be manager of the plant.

—*Georgia, Hawkinsville. The new cotton mill for which we reported subscriptions were being solicited will be known as the Hawkinsville Cotton Mills, with capital of $50,000 to $500,000; T. H. Grace, president and McC. Pate, secretary and treasurer. They propose having the plant, which will manufacture cotton yarns, No. 8 to 24, with equipment of from 3,000 to 5,000 spindles, in operation about Sept. 1st. None of the necessary machinery has been contracted for.

—*Georgia, Eatonton. At a recent meeting of the stockholders of the Middle Georgia Cotton Mills, B. W. Hunt was elected president; T. G. Greene, vice-president and E. B. Ezell, secretary and treasurer. Work will begin as soon as possible on erection of the mill, which will be equipped with 5000 spindles and about 125 looms. The subscriptions toward the capital stock now amount to $70,000.

—Georgia, LaGrange. J. M. Barnard, C. V. Truitt, F. E. Callaway, J. E. Dunson, J. H. Edmundson and others are interested in the erection of a cotton mill at this place and have applied for a charter under name of Unity Cotton Mills.

—*Georgia, Millen. The Millen Cotton Mill has been organized with a capital stock of $100,000 with J. H. Daniel, president; J. P. Applewhite, vice-president and R. Y. Daniel, secretary and treasurer. A site has been selected and work will be started on mill to be operated by steam power.

—*Georgia, Monroe. C. T. Mobley announces that the new Walton Mill at this place may be considered a certainty. 600 of the necessary 750 shares have been subscribed. It is expected that the entire amount of $75,000 will be subscribed by the time a charter can be issued, which will be about the 10th of March. A permanent organization will then be effected and orders for material and machinery will be placed as soon as possible thereafter.

—*Georgia, Newnan. The new cotton mill project for this place has taken different shape than at first proposed. A proposition has been made to the directors of the Newnan Cotton Mills, to put the $150,000, subscribed for the new plant, into the Newnan mills and have new plant built as an addition, and operated and maintained by the same management. It is said that there is very little doubt of the scheme being accepted at a meeting to be held soon by the Newnan Cotton Mills' stockholders.

—*Georgia, Tennille. The entire capital, $60,000, has been subscribed for the cotton mill at this place and it will be chartered with J. W. Smith, president; H. M. Franklin, vice-president; Jesse Baskinski, secretary; J. A. McCrary, treasurer and W. I. Witham, financial agent. Contracts will now be placed for building and equipping a 3000-spindle mill for manufacturing yarns.

—*Georgia, Tifton. H. H. Tift is president; L. G. Manard, secretary and treasurer and W. S. Witham, financial agent of the Tifton Cotton Mills, which propose erecting a 4000 spindle mill and contemplate installing 125 looms later on.

—*Georgia, Valdosta. J. N. Griffin informs us that the new company organized at this place and which has made application for a charter, will be known as the Valdosta Cotton Mfg. Co. At present they contemplate manufacturing cotton yarn and ball thread, but will make further investigations before definitely deciding. They have as yet purchased no machinery. The equipment will probably be about 5000 spindles.

—*Massachusetts, Hopedale. Plans are now being drawn for a new mill to be erected at this place by William Lapworth & Sons, who will remove the works, now at Milford, here, as previously reported. It is expected to have the new plant ready for occupancy about August 1st.

—*Mississippi, Kosciusko. The Kosciusko Cotton Mills, of which C. L. Anderson is president, have let the contract for erection of the mill building.

—*Mississippi, Laurel. Work will be started at once on erection of the new mill for the Laurel Cotton Mills Co. It is expected to have the plant, which will be 80x376 feet, 3 stories, in operation about August 1st. The boiler and engine rooms will occupy a separate building.

—*Mississippi, Tupelo. L. D. Hinds, president of the Tupelo Cotton Mill, will soon place contracts for machinery, etc., for the new mill. The site has been purchased and it is expected to have the plant completed and ready for operation, about October 1st.

—*Mississippi, West Point. All the contracts for the new $100,000 West Point Cotton Mill to be erected at this place have been let. It is expected to have the mill in operation about August 20th, 1900. Details of the plant were given previously.

—*Mississippi, Winona. A site has been purchased for the erection of the Winona Cotton Mill, about which we have given data in previous issue, and work will be started at once on erection of buildings.

—*Mississippi, Yazoo City. J. M. Barnwell is president and L. C. Montgomery, secretary of the Yazoo City Cotton Mills. Work will be started at once on arrangements for building the plant.

—New York, Stockport. It is reported that J. A. Hover, of Columbiaville, has purchased the Empire Loom Works, which have been idle for sometime, with a view to installing machinery for manufacturing yarn.

—*North Carolina, China Grove. We have been informed by C. J. Deal that the new spinning mill about which we made mention previously, will be equipped with 7,500 spindles. As soon as all the necessary stock is subscribed, the company will be organized with D. B. Coltran, president of the Narwood Mfg. Co., as president.

—*North Carolina, Clayton. A company has been formed with Ashley Horne, as president; A. Barbour, vice-president, and J. R. Williams, secretary, to operate the new cotton mill proposed at this place. The entire capital of $200,000 has been subscribed for and the company contemplate equipping the plant with 10,000 spindles.

—North Carolina, East Durham. The contract for the erection of the new cotton mill has been let to C. H. Norton, for $150,000. It is expected that the plant will be ready for operation about Jan. 1st, 1901.

—*North Carolina, Fayetteville. The Elk Cotton Mills has been incorporated with a capital stock of $60,000 by R. D. Warren, H. K. Holman, J. H. Reese, J. A. Moore and J. B. McLaughlin. They have not yet fully decided on location of the mill, which will be equipped with 5000 spindles.

—North Carolina, Goldsboro. A brick cotton mill building, 75x275 feet, will be erected by the Borden Mfg. Co., recently organized with Frank K. Borden, secretary-treasurer. The plant will be equipped with about 6,000 spindles.

—*North Carolina, Hickory. The new cotton mill at this place, in which we previously reported that E. L. Shuford had an interest has been incorporated as the E. L. Shuford Manufacturing Company. Data concerning the plant will be found in previous issues. Most of the machinery comes from Springvale, Me.

—North Carolina, Laurel Hill. The Laurel Hill Cotton Factory, with subscribed stock of $12,000, has applied for a charter and will increase the capital to $100,000.

—North Carolina, Lexington. The Winonah Mills Company has been chartered and incorporated at this place with capital stock of $150,000, to be increased, when desired, to $500,000. Among the incorporators are: W. E. Holt, Sr.; W. E. Holt, Jr. (Lexington) and Ethel Holt.

—*North Carolina, Mooresville. The Mooresville Cotton Mills have decided to erect a new mill to be known as Mill No. 2. The spinning machinery, power plant, etc., of the new mill, which will have 5000 spindles and 160 looms, has been ordered. Yarns and brown sheetings will be manufactured. About $100,000 will be expended.

—*North Carolina, New Bern. Bids for site for the new plant of the Pembroke Mfg. Company are now being received by William Dunn, J. A. Meadows and H. B. Duffy, who have been appointed a committee to receive same.

—*North Carolina, Newton. The Catawba Cotton Mill, which was recently incorporated with J. P. Yount, as president, is now operating 1600 spindles in manufacture of yarns and warps, 26 to 40. John Corbett & Sons, of Philadelphia, sell the goods.

—*North Carolina, Oxford. The Oxford Cotton Mill Company is the name of the new concern of which J. G. Hall is president and C. J. Cooper, treasurer. The capital stock is $125,000.

—*North Carolina, Smithfield. The Smithfield Cotton Mills have been incorporated with capital of $75,000; A. K. Smith, president and S. S. Holt, treasurer. They will manufacture yarns. The plant, which will be equipped with 5,000 spindles, will be operated by steam. As previously reported, they are in the market for all the machinery and are now receiving estimates on same.

—*North Carolina, Spray. Further information in regard to the Lily Mills, which we previously reported were incorporated with a capital stock of $10,000, privilege of increasing, is that colored cotton goods will be manufactured. B. Frank Mebane is president and J. S. McAlister, treasurer, of the plant which will be equipped with 300 looms and operated by steam. They contemplate beginning production of goods about May 1st. Selling agents not selected.

—*North Carolina, Statesville. A recent report states that the Cooleemee Cotton Mills, now erecting a plant at Ephesus, near Jerusalem, will erect another mill at property known as Lookout Falls, a short distance from this place. The new mill will have an equipment of 100,000 spindles and 5,000 looms.

—Pennsylvania, Philadelphia. The Diamond Cotton Co. is a new concern recently established at Wayne and Bristol Sts., in manufacture of stair pads, battings, mattresses and cotton filled goods. The plant is operated by steam.

—*Pennsylvania, Wilkes Barre. James A. Dodd is general manager of the Firwood Lace Trimming Co., with capital of $50,000 which has recently been chartered. It is proposed to make additions to the mill, which manufactures a fine quality of lace, until the number of operatives reaches 50.

—Rhode Island, Pawtucket. Arrangements are now being made by the Royal Weaving Company, of which D. L. Goff, is president, for building another mill. The plant, which is now located at Central Falls, consists of two mills, but they contemplate moving the entire plant to this place.

—Rhode Island, Warren. The Narragansett Yarn Mill has been organized by those interested in the Warren Foundry and Machine Company for reeling, winding and spooling yarns at the plant formerly operated and occupied by the above concern. They will do no spinning at present, and the present plans are largely experimental.

—*Rhode Island, Woonsocket. R. S. Fosberg, of Buffalo, N. Y., has been awarded the contract for erection of the new weave shed for the Social Mfg. Co.

—*South Carolina, Aiken. C. W. Davis (Augusta) Arthur S. Wattles (Canton Junction), Benj. W. Tingley (Phila.), and T. G. and G. W. Croft, (Aiken) have incorporated the Croft Manufacturing Company, with capital stock of $250,000. A large tract of land has been purchased upon which they will erect a cotton mill with equipment of 25,000 spindles and 750 looms. Print cloths will be manufactured.

—*South Carolina, Anderson. We learn by a recent report that the Riverside Mfg. Co., which we mentioned in a previous issue as incorporated with capital stock of $50,000, will manufacture cotton yarns and not knit goods.

—South Carolina, Bradley. The Almeta Cotton Mill has been incorporated with a capital stock of $100,000, with privilege of increasing to $250,000. E. W. Watson, J. H. White, Jr. and J. W. Scott (Verdery, S. C.) are among those interested.

—*South Carolina, Greenville. Thos. F. Parker is president and Lewis Parker, treasurer, of the new Monaghan Mills, recently incorporated with capital of $500,000. The plans have not yet been drawn for the mill, which will be equipped with 25,000 spindles as previously reported by us.

—South Carolina, Greenville. Work has been started on construction of the Sampson Cotton Mill. The plant will be equipped with 10,000 spindles and 428 looms.

—*South Carolina, Greenville. We have been informed by the American Spinning Co., that their No. 2 mill, now under construction, will be equipped with 10,080 spindles and 328 looms for making 35 and 51 1-2 inch sheetings. It is expected to have the new plant running in about six months.

—South Carolina, Greer's Depot. The Greer's Mill has been incorporated with capital stock of $45,000 privilege of increasing to $150,000, by W. W. Burgess, J. D. Ashmore, John A. Wyatt, W. B. Smith and others.

—*South Carolina, Honeapath. The new cotton mill, projected at this place, in which J. A. Brock, of Anderson, is reported as interested, has been chartered under the name of the Wilmot Mills, with capital of $200,000.

—*South Carolina, Kershaw. The Kershaw Cotton Mill has been incorporated with a capital stock of $125,000, by J. R. Barron (Rock Hill), S. D. Heath, R. L. Blackman and E. D. Blakeney (Kershaw). It is thought that work will begin on construction at an early date.

—*South Carolina, McColl. Application for a charter for the incorporation of the Iceman Mills has been made by F. P. Tatum, Charles Iceman, T. G. Gibson and others. The capital stock is $200,000 and they are making arrangements to build a 10,000 spindle plant for making fine combed yarns.

—*South Carolina, Woodruff. We note further information regarding the proposed cotton mill at this place. M. W. Smith (Abbeville), E. A. Smyth (Pelzer) and W. J. Gray and G. M. Lanford have incorporated under the name of the Woodruff Cotton Mills.

—*Tennessee, Covington. We learn that the mill reported in our issue of the 2nd inst., refers to the Tipton Cotton Mills, about which we gave data in an earlier copy. The company of which J. C. Boals is president and W. V. McFadden, treasurer, will make 4 yard sheetings for domestic trade and later manufacture goods for export. They expect to have the plant in operation about the last of the year.

—*Tennessee, Jackson. The Flynt Building and Construction Co. has been awarded contract for the erection of the Bemis Bros. Bag Co. (89 State St., Boston) at this place. With the exception of overseers and superintendents, local help will be employed.

—*Tennessee, Knoxville. Charter has been granted to the Knoxville Cotton Mills Co., recently incorporated with capital stock of $250,000; Col. C. M. McGhee, president, L. D. Tyson, vice-president and general manager, and C. T. Leonard, secretary-treasurer. A site has been selected and work will start on erection as soon as the weather permits.

—*Texas, Cuero. We learn from F. P. Sames, president of the Board of Trade, that $70,000 of the proposed capital stock of $100,000 has been subscribed for the new cotton mill and the balance is assured. Officers will be chosen this week. It is proposed to make the coarser grades of cotton fabrics, and they are in the market for the entire equipment for such a mill, and will need the services of a competent superintendent. They have water power and a new power plant capable of developing 750 H. P., and expect to use water power, although fuel is cheap, and they are not quite decided on this point.

—*Texas, Henderson. The Rusk County Cotton Mills have elected officers as follows: W. J. Graham, president; Samuel Patton, secretary, and A. Wettermark, treasurer. The mill is to be built on the instalment plan. Capital stock $100,000, $50,000 of which has already been subscribed and 10 per cent paid in.

—*Texas, Paris. W. F. Gill, secretary of the Commercial Club at this place, informs us that there are several cotton mill enterprises on foot. The Commercial Club is endeavoring to secure subscriptions for a $100,000 mill, probably to manufacture coarse goods. No plans have yet been settled upon, as the subscription list has not progressed far enough. Another mill is projected by J. A. Varner, W. A. Collins and W. F. Dulaney, who have hitherto been in the machinery business. They recently announced that next year, or perhaps the latter part of this year, they will build a $100,000 mill plant. R. Forwood is also investigating the cotton manufacturing business. Mr. Gill advises us that there is an active interest in cotton manufacture developed in Texas this past year, which he thinks will materialize in the erection of 10 to 15 new mills in the state.

—*Texas, Pilot Point. We learn from A. H. Gee, president of the Pilot Point National Bank, that $55,000 has been subscribed for the new cotton mill project, but no meeting of the subscribers has yet been held and no definite action has yet been taken in any way. Not being familiar with the cotton mill business, they are going slow at present.

—*Texas, West. The West Cotton Mills have been incorporated with $100,000 capital; B. B. Ingraham, president; H. B. Peebles, treasurer; Geo. N. Denton, secretary. Work will be started on construction of new building about July in order to have it running about August, 1901, making coarse fabrics, probably sheetings and shirtings. The plant will be equipped with 5000 spindles, and will be operated by steam power. Geo. N. Denton informs us that they have not yet placed contracts for any of the machinery.

Enlargements and Improvements.

—*Alabama, Eufaula. The Eufaula Cotton Mills, which we previously mentioned as to install additional machinery, will add over 300 looms and 1,200 spindles to their plant.

—Alabama, Huntsville. T. W. Pratt and his brother, Russell Pratt, have purchased Joshua Coon's interest in the West Huntsville Cotton Mills. The Messrs. Pratt will make enlargements and improvements to the plant.

—Connecticut, Middletown. The branch mill of the Arrawana Mills, on Center Street, will soon be put in operation making cotton yarn. I. E. Palmer, the proprietor, proposes weaving all the yarn needed for the hammocks at this place, while the mill, recently purchased by him at Turnerville, will supply the necessary twine.

—*Georgia, Hartwell. The Hartwell Cotton Mill, now known as the Witham Cotton Mills, now operating 3000 spindles and 102 looms, will double its plant.

—*Massachusetts, Chicopee Falls. A large steam plant, to contain boilers of 3000 h. p. and an engine of 1,275 h. p. and a new mill, 220x120 feet, 4 stories, will be built by the Chicopee Falls Mfg. Co. It is expected to have both the power plant and the mill in operation Jan. 1, 1901.

—*Massachusetts, Fall River. The Stafford Mills will erect a large weaving shed to accommodate 400 looms and put in necessary spinning.

—*Massachusetts, New Bedford. We have been informed by The New England Yarn Company in regard to addition previously reported by us to the Bennett Mills, that the Company will increase the total number of spindles operated to 650,000, adding about 50,000 to present number and part of which will be installed in this new addition to the Bennett.

—*Massachusetts, Worcester. The Wachusett Mills Co. have commenced operations with 25 of their looms in the Sargent building, which we recently reported they were negotiating for. Extensive improvements and additions have been made to the plant. The balance of the machinery will be started as soon as installed.

—*New Hampshire, Manchester. Work has been begun tearing down the No. 5 mill of the Amoskeag Mfg. Co. for purpose of erecting a new picking mill.

—New Hampshire, Nashua. Extensive additions and improvements, costing about $50,000, are to be made in the spring to the plant of the Jackson Mfg. Co. A building, to be partially used as an engine house, will be erected and a new 600 H. P. engine will be installed. A rope tower for transmission purposes will also be built. New machinery for making finer yarns will also be added.

—*North Carolina, Kings Mountain. Work will be started this spring on increasing the capacity of the Lulu Cotton

Mills. They now have 2,500 spindles for manufacturing coarse yarns for hosiery.

—*North Carolina, Wilmington. The Wilmington Cotton Mills, which we previously reported had made additions to their machinery, will now install several hundred new looms.

—Rhode Island, Centreville. The erection of a large weave shed is contemplated by the Warwick Cotton Mills, now running over time. About 1600 looms will be installed in the new mill.

—Rhode Island, Pawtucket. An addition is to be built to the plant of the Union Wadding Company, on site of building formerly occupied by Willmarth & Mackillop, which is now being torn down.

—*Rhode Island, Slatersville. The Slatersville Mills have been purchased by the National Flax Fibre Co., of which John M. Hathaway, is superintendent. The mills, which are now operated on ginghams, cotton-worsteds and other similar fabrics, will soon be used for making linen goods, such as towelling, table cloths, etc. The present machinery will be used with a few new attachments adjusted. The company's Boston office is 219 John Hancock Bldg.

—*South Carolina, Abbeville. The Abbeville Cotton Mills, which have been operating nights, will install 13,000 spindles, and when completed will discontinue the night work.

—*South Carolina, Anderson. The Anderson Cotton Mills, which have recently completed addition of 6000 spindles and 200 looms to the plant, will install 18,000 more spindles and 524 looms. The capital stock of the company will be increased from $500,000 to $600,000.

—*South Carolina, Tucapau. We have been informed by T. E. Moore that the report concerning erection of a 10,000 spindle mill at Wellford is erroneous, but that an addition of 10,000 spindles will be made to the Tucapau Mills, of which he is treasurer. We reported in a previous issue that an addition was contemplated by the Tuscapau Mills.

—South Carolina, Yorkville. The capacity of the Sutro Cotton Mills, T. Baxter McClain, proprietor, will be increased.

Mills Starting Up.

—*New York, Sherburne. Operations have been begun in the Ross Cotton Mill, recently purchased by Quentin McAdam, who will utilize it for spinning in connection with his other plant.

—*South Carolina, Arlington. Operations will be resumed in a few days in the Arlington Cotton Mill, which has been idle for about three months, during which time new machinery, which increases the number of spindles to 8,000, has been installed.

—*Tennessee, Chattanooga. The Richmond Spinning Mill will be put in operation as soon as the proposed force of operatives is secured.

—Tennessee, Newport. J. L. Erwin, of Burlington, N. C., has purchased the Newport Cotton Mill for $20,000. He will make improvements and additions to the plant and will put it in operation as soon as possible.

Woolen.

New Mills.

—*California, Eureka. The Humbolt Bay Woolen Mill Company has been formed to operate the proposed new mill at this place for which subscriptions toward the capital stock are now being taken. William Carson, Robert Porter, John M. Vance and J. W. Henderson are among the directors chosen for the first year.

—New Mexico, Las Vegas. A report states the New York woolen manufacturers, represented by C. B. Steen, have purchased a site at this place and will erect a woolen mill, which will give employment to about 200 men. We think it is more likely a scouring mill.

—Oregon, The Dalles. The Dalles Wool Scouring Mill Company has been incorporated by Grace E. Russell, J. M. Russell and N. W. Rountree, with a capital of $25,000. The company will establish a scouring plant at this place.

—Pennsylvania, Philadelphia. A new felt boot plant, for making wool felt and knitted boots, will be put in operation soon by Geo. Watkinson & Co., rubber-boot and shoe manufacturers, 36th & Reed Sts. Joshua Olroyd, formerly of Howell's Depot, N. Y., whose plant was sold and machinery removed to this place, will be manager of the mill.

—*Tennessee, Chattanooga. The Chamber of Commerce advises in relation to the proposed woolen mill at this place that it is being organized principally by local capitalists and some from outside. A special committee of the Chamber of Commerce has it in charge. A new building will be erected and a 30-loom plant installed to manufacture a general line of men's wear woolens. Steam power and dye house. None of the equipment has been arranged for.

Enlargements and Improvements.

—Connecticut, Rockville. Plans have been prepared by the American Mills Co. for a new dye house to be erected south of the present one.

—Connecticut, Stafford Springs. An addition is to be erected by the Central Woolen Company, 46x47 feet, 4 stories.

—*Maine, Bridgeton. The Pondicherry Company have completed an addition, 56 x48 feet, 3 stories, to their No. 1 mill, also a brick boiler house, 56x48 feet and installed a battery of new boilers and a 200 h. p. engine, and added 16 looms. Mill No. 1 will make cassimeres, cheviots, dress goods, etc., and Mill No. 2 flannels. They have decided not to put in the finishing machinery at present.

—*Maine, Skowhegan. A new department is to be added to the Marston Worsted Mill, which we previously reported making other additions and improvements. Spooling machinery is to be installed in the fourth story, giving employment to about 25 more people.

—*Massachusetts, Gleasondale. C. W. & A. D. Gleason are building a large addition to their plant, in which they will install more looms.

PERSONAL RECORD.

Cotton.

—W. L. Barrell, superintendent of the Lawrence Duck Mills, Lawrence, Mass., has recently been appointed selling agent of the company, with an office in Boston.

—A. J. Cobb, formerly of the Pacolet, S. C., mills, entered upon his new duties as superintendent of the Fairmont Mills, Fairmont, S. C., March 1.

—C. F. Faulkner, late overseer of weaving of the Avondale Mills at Birmingham, Ala., is the new superintendent of the Meridian Cotton Mills at Meridian, Miss.

—A. B. Shipp, superintendent of the Eufaula, Ala., Chewalla Mills, on April 1st resigned, and E. Grover, recently of Selma, Ala., has been appointed to fill the vacancy.

—C. T. Maxwell has resigned as superintendent of the Roanoke Rapids (N. C.) Knitting Mills. He has had charge of the mills since they were started, about four years ago. He has returned to Philadelphia, where he will become the superintendent of a textile plant in which his father is largely interested. John Donahue, Albany, N. Y., will be the superintendent of the knitting mills at Roanoke Rapids.

—Pardon E. Sanford, who recently resigned as assistant superintendent of the No. 3 mill of the Globe Yarn Co., Fall River, Mass., has assumed his new duties as superintendent of the Utica Spinning Co.'s new mill, Utica, N. Y. His former help presented him with a diamond stud upon his taking leave.

—James G. Brackett, who has served continuously for upwards of 50 years as superintendent of the Laconia Co., Biddeford, Me., has relinquished that position and Robert S. Donaldson, overseer of the spinning, has succeeded him. Mr. Brackett has not severed his connection with the company, but has given up the active work of the mills. Mr. Donaldson has been in mills since he was nine years old, and from 1881 to 1891 had charge of spinning in the Pepperell Mill. He then went to Aurora, Ill., to take charge of the spinning and drawing in the Aurora Cotton Mills. He returned to Maine in 1895 and filled an overseer's position in one of the Lewiston Mills, and four years ago became overseer of the spinning in the Laconia mill. George Kennison, Mr. Donaldson's secondhand, has been promoted to overseer.

—John F. Tibbetts has resigned the superintendency of the hosiery yarn mills of the Montmorency (P. Q.) Cotton Mills Co. in order to accept a similar position at West Warren, Mass. Frank W. Hicks has succeeded him.

—Nathan Angell has accepted the position of overseer of weaving with the North Scituate (R. I.) Cotton Mills.

—W. A. Ballou, paymaster at the Atlantic Cotton Mills, Lawrence, Mass., has severed his connection with the mills. C. B. Chapman of Crompton, R. I., has taken his place.

—William A. Bower, for many years overseer of the spinning room of the Otis Company, Ware, Mass., has severed his connection with that concern to engage in the hardware business with his brother in Methuen.

—John Bethel, formerly with the Globe Yarn Mills, Woonsocket, R. I., has been appointed overseer of mule spinning with the Richmond Spinning Co., Chattanooga, Tenn., and started recently for the South.

—George L. Brocklehurst has been appointed boss weaver by the Corr Mfg. Co., Taunton, Mass.

—Charles Dring, foreman of the foundry of Kilburn, Lincoln & Co., Fall River, Mass., for nearly 32 years, has tendered his resignation. The employees of the moulding department presented Mr. Dring with a gold-headed cane.

—Benjamin Fay, secondhand in the card room of the Sanford Spinning Co., Fall River, finished his duties there recently and is now overseer of carding at the Globe Yarn Co.'s mill, No. 3, Fall River, Mass.

—James L. Harring, overseer of spinning, spooling and warping for the Falls Co., Norwich, Conn., has resigned to accept the position of overseer of spinning for the New Hampshire Spinning Co. of Penacook, N. H. Mr. Harring has been overseer at Norwich, Conn., for the past five years, where he has many friends who regret his departure, but wish him all possible success in his new undertaking.

—Albert Harrup is now foreman of the weaving department of the Namquit Mill, Bristol, R. I., succeeding William Andrews, who had been foreman for a number of years, but was obliged to resign on account of ill health.

—George Hobson, overseer of the mangle room at the Fall River Bleachery, Fall River, Mass., has resigned.

—George Hopkins, formerly loom fixer at the Pontiac Mill, Pontiac, R. I., has accepted the position of overseer of weaving at the Rockland Mills, Rockland, R. I.

F. W. Hicks is the new superintendent at the Montmorency Cotton Mills, Montmorency, P. Q., Canada.

—William H. Kingsley, overseer of weaving in the Farnumsville Cotton Mills, Farnumsville, Mass., has resigned, and is now overseer of weaving at the Peabody Mills, Newburyport.

—Thomas Kenney, after many years of service as overseer of carding at the Conanicut Mills, Fall River, Mass., has severed his connection with that company, and now fills a similar position with the Globe Yarn Co., Fall River.

—L. H. Lawrence has been appointed overseer of carding and spinning of the Forsyth, Ga., mills. He was until recently with the Eagle & Phoenix Mills, Columbus.

—C. T. Leonhardt, of New York, is to be the secretary and treasurer of the Knoxville Cotton Mills, Knoxville, Tenn.

—William Lee, overseer of carding in the No. 4 mill of the Lonsdale Co., Lonsdale, R. I., has resigned to take charge of the carding department of the Lawton Spinning Co., Woonsocket, R. I. He was presented with a gold chain and Masonic charm upon his taking leave.

—P. S. Monast has been succeeded as overseer of ring spinning at the Bourne Mills, Fall River, Mass., by Napoleon Fisher of Newburyport.

—W. W. McIntosh is now overseer of carding and spinning at the Odell Manufacturing Co., Bynum, N. C. He was formerly of the Jonesboro, N. C., mill.

—C. A. Mann is now overseer of carding and spinning on night force at the Pilot Mills, Raleigh, N. C. He recently resigned his position with the Fries Woolen Mill, Salem, N. C.

—Robert McEwen has resigned as boss spinner at the Hathaway Mills, New Bedford, Mass.

—Peter H. O'Neill resigned recently as overseer of the weaving department of the Lorraine Mills, Pawtucket, R. I., after two years' service at the mill.

—Thomas Osfield has assumed his new duties as overseer of weaving at the Lorraine Mills, Pawtucket, R. I. He was formerly at the Hargraves Mills, Fall River, as section hand, and later as loom fixer at the Lorraine Mills.

—Albert K. Pratt, overseer in the weaving department of the Paul Whitin Mfg. Co.'s mills, Northbridge, Mass., has left the employ of the company.

—W. S. Porter, late overseer of spinning of the Sycamore Mills, Sycamore, Ala., is now overseer of weaving and slashing at the Natchez Cotton Mills, Natchez, Miss.

—William H. Rankin, recently in charge of the dyeing department of the Manchester (N. H.) Print Works, has accepted the superintendency of the Eagle and Phoenix Cotton Mills, Columbus, Ga.

—C. E. Robinson has been appointed master mechanic at the Exeter (N. H.) Cotton Mills to take the place of L. D. Lyford, who was drowned near the dam of the corporation in February, while overseeing the removal of some ice.

—G. A. Whitney, formerly of Galveston, Texas, now has charge oft he spooling, warping, slashing and weaving, both day and night, at the Overland Mills, Overland, Col.

—Louis Simpson has resigned as manager of the Montreal Cotton Co., Valleyfield, P. Q. For the present his private affairs demand his attention, and he will make no other mill connection at once.

—Harry Stein has resigned as boss starcher at the Boston Finishing Works, Williamstown, Mass., and Thomas Kirkman has been appointed to succeed him.

—Joseph H. Ottenheimer and Edgar M. Young have resigned their positions with the Windham Cotton Co., Willimantic, Conn., as overseers of mule spinning and carding respectively, and will run the cord mill at Turnersville, Conn., for J. E. Palmer of the Arrawana Mills, Middletown.

—John Tattersall of Manchester, N. H., is Joseph Ashworth's successor as overseer of printing at the Contrexville Mill, Manville, R. I.

—Peter F. Walsh has resigned his position at the Shore Mills Nos. 1 and 2, Fall River, to become overseer of weaving at the Tecumseh Mill No. 1, in that city.

—Marcus Woodreau has assumed his new duties as overseer of the weaving department of the Ashton Mill, Ashton, R. I.

W. H. Willis, designer at the Hathaway and Acushnet Mills and overseer of the drawing room of the Acushnet Mill, has resigned to become superintendent of a mill at New Orleans.

—W. K. Sanborn has been appointed to succeed James W. Shea as superintendent of the Roger Williams Cotton Mills, Arcadia, R. I.

—J. M. Beaty, late secretary and treasurer of the Fairfield Cotton Mills at Winnsboro, S. C., has removed to Charlotte, N. C., with his family, where he has a responsible position with the D. A. Tompkins Co., engineers and contractors, as secretary. He will also be secretary of the Atherton Cotton Mills of Charlotte and the High Shoal Cotton Mills, and will assist the president, Mr. D. A. Tompkins, in the sale of their products.

Woolen.

—Hugo Schultz is now finisher at F. S. Mackenzie's mill at Bridgewater, Vt., filling R. Rotheray's place, who has been obliged to give up work for the present on account of illness.

—C. H. Adams, formerly of Camden, Me., has secured the position of overseer of weaving at the Crosby Mfg. Co.'s mill, Glastonbury, Conn.

—W. H. Baldwin, of Providence, R. I., is now dyer at the Bethel Worsted Mills, Ashaway, R. I.

—Charles Bromley, for the last three years boss carder for the Niantic Manufacturing Co., East Lyme, Conn., has resigned to accept a similar position with E. Kenyon & Son, Kenyon, R. I.

—Jacob Babcock has resigned his position at the Harrisville Woolen Mill, Harrisville, R. I., and is now at Robert Bleakie's Mill, Hyde Park, Mass.

—John W. Bentley, who recently accepted the position of overseer of drawing at the Lymansville Co., Lymansville, R. I., has resigned.

—Anrew Burnside, for the past 13 years in the employ of the Lymansville Co., Lymansville, R. I., recently resigned his position with them as overseer of spinning and twisting, and has accepted a similar position with the Manhattan Worsted Mills of Pitkin, Holdsworth & Co., New York.

—Charles Bragg, agent of the Milner Worsted Mills, Moosup, Conn., has resigned, and Fred Ballou, who has been superintendent, has been appointed in his place. George Leach of Manton, R. I., has become superintendent and designer.

—J. L. Broughton, boss burler at the Mills of the Rock Mfg. Co., Rockville, Conn., has resigned.

—Alfred H. Burnham, designer for the Southwark Mills Co., Philadelphia, has accepted the appointment of assistant superintendent of the Glasgow Mills, recently started at Jasper and Huntingdon Sts., Philadelphia, Pa.

—Charles King, formerly of the Thayer Woolen Co., North Oxford, Mass., is now boss carder at the Lamb Woolen Mill, Oxford, Mass.

—L. C. Werner, formerly of Louisville, Ky., is now superintendent of the Taconic Mills, Pittsfield, Mass.

—Walter E. Scott is now treasurer of the Penobscot Woolen Mills, Dexter, Me., W. H. Abbott having resigned.

—Charles Bromley, of East Lyme, Conn., is now boss carder for E. Kenyon & Sons, Kenyon, R. I.

—George Cathcart, overseer of dressing spooling and twisting for the Old Town Woolen Co., Old Town, Me., has resigned.

—John T. Durken, formerly of the Geneva Mills, Providence, R. I., has secured the position of overseer of weaving at the Glen Woolen Mills, West Fitchburg, Mass.

—Ambrose DeMeers has been appointed boss dyer for the Raritan Woolen Mills, Raritan, N. J.

—George E. French, formerly with the American Worsted Co., Woonsocket, R. I., where he had charge of twisting and spooling for a number of years, is now overseer of the skein winding and spooling at the Puritan Woolen Mills, Plymouth, Mass.

—Roger Graham has severed his connection with the Lymansville Co., Lymansville, R. I., to accept a position with the Cranston Worsted Mills, Bristol, R. I., as boss machinist.

—Jasper Howe, after a period of 50 years' service with the Bigelow Carpet Co., Clinton, Mass., has resigned. For several years Mr. Howe was secondhand, and for the last 30 years has been overseer of the cloth room.

—Francis E. Handy has secured the position of boss weaver at the Glen Woolen Mill, Shewville, Conn.

—Joshua Heaton, formerly of Philadelphia, is now overseer of spinning for the Dundee Woolen Co., Passaic, N. J.

—Robert J. Harrington, formerly of Hinsdale, Mass., has secured the position of boss spinner at Andrew & Reddick's mills, Dalton, Mass.

—Arthur Isles, for the past three years foreman of the twisting department in the Tillotson Mills, Pittsfield, Mass., has resigned to accept a position in Philadelphia. A number of employees gathered at his home and presented him with a silver shaving set in a plush-lined oak case.

—D. E. Jenkinson of E. Wilton, Me., has accepted the position of boss weaver at the Ludlow Woolen Mills, Ludlow, Vt.

—E. R. Johnson, formerly of the Calumet Woolen Co., Northbridge, Mass., is now in the employ of Andrew & Reddick, Dalton, Mass., as dyer.

—Welcome Kelley, formerly boss finisher at the Lippitt Mill, Woonsocket, R. I., has now a similar position in the wool boot department of the United States Rubber Co.

—Andrew Kurtzner, for several years overseer of carding for the Faatz Brush & Felting Co., Lestershire, N. Y., resigned recently.

—Levi Lockwood, secondhand in the French River Textile Co.'s mills, Mechanicsville, Conn., has been promoted to boss weaver.

—Wm. F. Myers, late boss carder at the Norfolk Mill, Norfolk, Conn., is now boss carder for Daniel Curtiss Sons, Woodbury, Conn.

—John Mehan, recently filling position of secondhand in Uxbridge, is now boss carder in Chas. C. Capron's mill at Uxbridge, Mass.

—Patrick A. Mulcahy, formerly of the Fitchburg Worsted Co., Fitchburg, Mass., is now in the employ of the Dalton Woolen Mills, Dalton, Mass., as boss weaver.

—M. J. Nelson has taken charge of finishing at the Robinson Mills Co., South Windham, Me. They are making broadcloths and kerseys, and are so busy that they are working overtime.

—Herbert Rowell, for several years foreman oft he dyeing department at E. M. Rockwell's woolen mill, Leominster, Mass., has resigned to accept a position in a mill in Pascoag, R. I.

—J. H. Rule, formerly of Lowell, Mass., is now superintendent of the Peck Mfg. Co.'s No. 2 mill, Pittsfield, Mass.

—William Roberts, late overseer of dyeing for the Hudson River Woolen Mills, Newburgh, N. Y., has accepted a similar position with the Stroock Felt Co., that city.

—Edward Slugg has removed from Philadelphia to Providence, R. I., having recently given up his position as boss finisher with the Brighton Manufacturing Co., on account of his wife's health.

—Gustave F. Sagon, boss weaver at the French River Textile Co.'s mill, Mechanicsville, Conn., resigned recently.

—Arthur Wilkins is the new boss spinner at the Kennebec Worsted Mills, Fairfield, Me.

—E. C. Wardman has entered upon his new duties as boss spinner at the mill of the French River Textile Co., Mechanicsville, Conn.

—W. F. Ward resigned recently as boss weaver at the Ballardvale Mills, Ballardvale, Mass.

—E. A. Williams, for the past seven years foreman of the weaving department in the Napa (Cal.) Woolen Mills, has been appointed overseer of weaving in the San Quentin Jute Factory at San Quentin, Cal.

—Dainel Walsh is overseer of wet finishing on night force at the Tillotson Mill, Pittsfield, Mass.

Knit.

—John H. Akin, formerly in charge of night work in the Commercial Knitting Mills, Troy, N. Y., is now employed as overseer of carding in the Hope Knitting Company's mills, Cohoes.

—M. C. Beers has accepted the position of boss knitter with the Continental Knitting Co., Cohoes, N. Y., having succeeded Mr. Overocker, who has accepted a position with the Roxford Knitting Co. at Philadelphia. Charles LaDane, who was for 18 years boss knitter for Clark & Holsapple, is Mr. Beers' secondhand.

—F. A. Drury, president of the Massasoit Knitting Co., Spencer, Mass., is to retire.

—Frank Fenner has resigned his position with the Victor Knitting Mills Co., Cohoes, N. Y., to become foreman of the finishing room of the Regal Knitting Mill, Utica, N. Y.

—F. G. Giddings has resigned his position with the Gloversville Knitting Co., and is now employed as machinist in the General Electric Works of Schenectady, N. Y.

—James Heslin has been succeeded by Mr. Fountain as overseer of carding for the Waterford Knitting Co., Waterford, N. Y. Mr. Fountain formerly filled a similar position with the Commercial Knitting Co., Troy.

—W. Hehoe, of Little Falls, N. Y., is now boss knitter at the Vesta Knitting Mill, Providence, R. I.

—William Lee has been employed as overseer of finishing by the Alpha Knitting Co., Schenectady, N. Y.

—Winthrop Mincher has resigned as bookkeeper at the Clye Knitting Mill, Waterford, N. Y., to accept a similar position in Philadelphia.

—Stephen P. Middleton, formerly with William G. McMann, Philadelphia, has accepted a position with Wallace Wilson, proprietor of the Vigilant Mills, Frankford, Philadelphia.

—John Nichol, foreman of the finishing at the Alpha Knitting Mill, Schenectady, N. Y., where he has been for the past four years, resigned recently to accept a similar position with A. V. Morris & Son of Amsterdam. At the Alpha Mill he directed the work of about 80 girls, and upon his departture they presented him with a diamond stud as a token of esteem and good will.

—E. P. Sheridan has severed his connection as manager with the Durham Hosiery Mills of Durham, N. C. He will remain in Durham for the present.

—Herbert Taylor, overseer of carding at the Olzemdam Hosiery Mills, Manchester, N. H., for the past three years, resigned recently.

—Thomas Temple of Fort Plain, N. Y., has been engaged to take charge of the carding and spinning of the Bailey Knitting Mills, in that city. Squire Bailey is boss knitter and superintendent. J. F. Scott has charge of the finishing room.

—Charles Wilson, formerly bookkeeper at the Superior Knitting Mill, Hoosick Falls, N. Y., has accepted a simlar position with the Clyde Knitting Co. at Waterford, N. Y.

—Matthew Ward, who has been for several years in charge of carding at the Dudley Hosiery Mills, Newton Lower Falls, Mass., has resigned.

Deaths.

—Dexter N. Richards, a well-known Boston manufacturer, died March 27th at his residence in Longwood, at the age of 77 years. He held the office of treasurer of the Bates Manufacturing Co., Lewiston, Me., from 1888 to 1898. He had also been president of the Manchester Mills, Manchester, N. H., and of the Edwards Mills in Augusta, Me., and a director in the Lewiston, Me., bleachery. For more than 30 years he was connected as a director with the street railroad companies in Boston. He was also trustee of many large estates, a director of the Bank of Redemption for nearly 20 years, and was one of the original incorporators and also a director in the Boston Electric Light Co. Mr. Richards had been in poor health since he relinquished the office of treasurer of the Bates Co.

—Theodore Reynolds of Monson, Mass., died March 30th, at the age of 57. He was surviving member of the firm of R. M. & T. Reynolds, his brother having died not long ago. They operated two woolen mills at this place, and had been very successful, and Mr. Reynolds was reported to be a multi-millionaire. He was one of the largest stock holders in the Boston & Albany Railroad, and was interested in many industrial enterprises not only in his immediate neighborhood, but elsewhere. He leaves no immediate family, and it is not yet known how his death will affect the future of the woolen mills, which, however, have been running rather slack since the death of his brother. Mr. Reynolds had suffered for some time from a disease of the throat, and a surgical operation was performed in the hope of giving him relief, but he did not rally from it and died soon after.

—James S. Gill, about 70 years old, a wealthy business man of Boston, met with a fatal accident at East Cambridge, Mass., shortly before noon on March 14th. He had been inspecting the new Middlesex county registry of deeds building, and was descending the long flight of stairs, when, within a few steps of the bottom, he fell, striking heavily on his head. Death resulted almost instantly. Mr. Gill was the principal owner of the woolen mills in Ludlow, Vt., and had recently bought the Ashuelot Mills in New Hampshire, which were being started up.

—John Capstick, senior partner of the firm of John Capstick & Sons, died at his home on March 8th, 1900. Mr. Capstick was well known in the dyeing and printing trade, being one of the oldest colorists in the United States. He leaves two sons and two daughters. His sons, John H. and Thomas, survive him in the business, and will run and operate the works at Montville, N. J. Mr. Capstick was 75 years old at the time of his death.

—Israel F. Brown, president of the Brown Cotton Gin Co., died at New London, Conn., March 24th. He began the manufacture of cotton gins at Clinton, Ga., and continued the industry at Prattville, Ala.; Girard, Ala. and Macon, Ga. In 1858 he located in New London and built up one of the largest factories of the kind in the world. At the time of his death he was 90 years old.

—Donald Freems died at his home, 987 Twenty-third St., South Brooklyn, N. Y., March 12th. He was ill but a few days. He contracted a cold while returning from Scotland, where he had been for a short visit, which developed into pneumonia. Mr. Freems was engaged in the linen business in Scotland, and several years ago came to New York to establish a branch to his house, and had since lived in this country. He resided in New York for some time and then removed to South Brooklyn, retiring two or three years ago. He was 67 years old.

—Peter Black died recently, in Lawrence, Mass., aged 59 years. He was for many years assistant superintendent of the bleachery at Lewiston, Me., later removed to Peabody, to accept a similar position in the bleachery there, and in 1885 went to Lawrence to take charge of the finishing at Farwell's bleachery.

—Jacob Mandler, president of the Toledo Knitting Works at Toledo, O., died in that city recently.

—William W. Biddle, a widely known woolen merchant, died at his residence, 4804 Chester Ave., Philadelphia, March 19.

—James McMann, a retired hosiery manufacturer, died March 8th at his home in Philadelphia. Mr. McMann was born in Belfast, Ireland, in 1835. He came to this country in his youth and learned the hosiery trade with his brother, and continued in it until 1896. He had been in poor health for the past two years or more.

—Edwin Knowles, widely known in mill circles throughout the country as the purchasing agent of B. B. & R. Knight, cotton cloth manufacturers, died at his residence at 47 Stewart St., Providence, R. I., March 22d, from pneumonia. Mr. Knowles was born in Southern Rhode Island in 1837. He worked in his father's mill in Shannock and later entered the employ of B. B. & R. Knight, and since that time has witnessed the growth of their business until today it is the largest in the world.

—Jacob Greil, president of the People's Cotton Factory, Montgomery, Ala., and one of the wealthiest men in the state, died March 20th.

—James D. Smith, for the past 14 years designer of patterns at the Manville Co.'s mill, Manville, R. I., died at his home on Cottage St., March 26th.

—Patrick D. Cullen died March 20th in Pascoag, R. I. He was president and superintendent of the Warren Woolen Co. of Stafford Springs, Conn., for upwards of 12 years, and was also one of the heaviest stockholders. Later he operated a mill at Westerly and went to New York and met with heavy losses. His ill fortune affected his health and he was soon forced to retire from active business. He travelled through the United States and Canada, and for the last three years has lived in Pascoag, never having recovered his health.

—Samuel Bernstein, a well known resident of Mt. Vernon, N. Y., died at his home on Chester Hill, recently, aged 73 years. He was born in Germany, and came to America in 1844. He was in the silk business in New York City for many years.

—Martin L. Weeks, for a number of years head machinist for the Yantic (Conn.) Woolen Co., died in that city recently of heart disease.

—Thomas W. Mayhew, aged 70, has deceased at Paterson, N. J. For a number of years he was in the silk business at Shelburne Falls, Mass. A son, Francis H. Mayhew, is a silk manufacturer at Wortendyke, N. J.

—Irving A. Davis, well known to the woolen trade of New England, died at his residence, 12 Gardner St., Chelsea, Mass., March 2, aged 45 years. He was born in Portland, Me., but had resided in Chelsea for nearly 40 years.

—Frederick D. Northrop, Clinton, Mass., overseer of spinning and spooling in the Lancaster Mills, died recently, aged 58 years.

—Benjamin F. Hollingsworth, of Dover, N. H., died recently at his home, aged 66 years. He had been in the employ of the Sawyer Woolen Mills for many years and at the time of his death was overseer of the carding department.

—Oscar Hennig, an overseer in the Germania Woolen Mills, Holyoke, Mass., fell down an elevator shaft, a distance of about thirteen feet, and was instantly killed.

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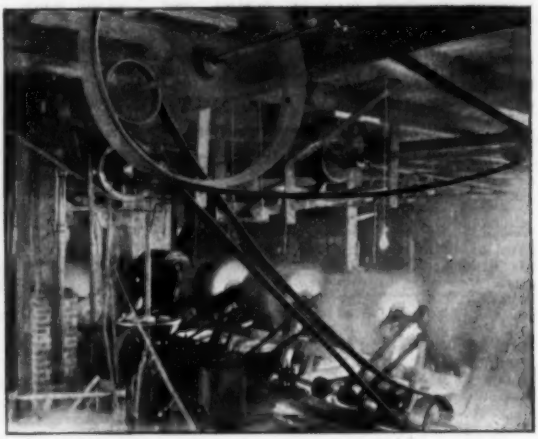

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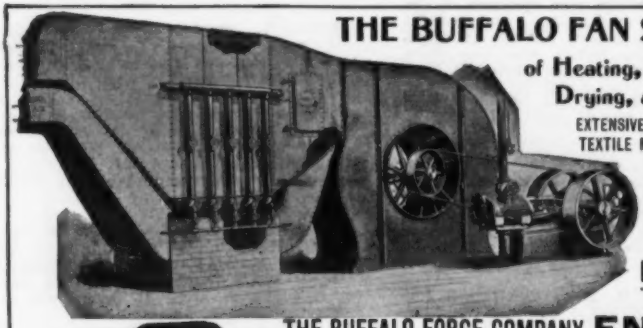

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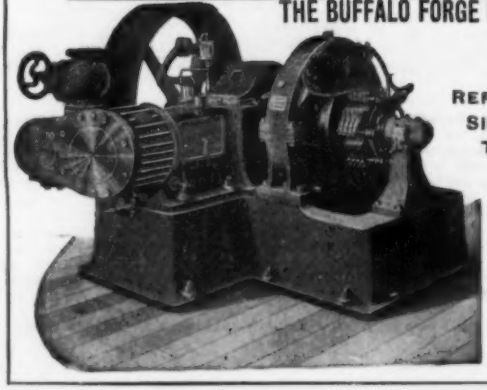

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Alphabetical Index to Advertisements follows this Classified List.

Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.

Arc Lamps.
Lea Manufacturing Co., Elwood, Indiana.

Architects and Mill Engineers.
Berlin Iron Bridge Co The, East Berlin, Ct.
Ferguson, John W., Paterson, N. J.
Tower & Wallace, Broadway and 25th St., New York, N. Y.

Artificial Stone.
Warren Bros. Co., 143 Federal St., Boston.

Asphalting & Asphalt Materials.
Warren Bros. Co , 143 Federal St., Boston.

Asphalt Roofing.
Warren Bros. Co. 143 Federal St , Boston.

Automatic Feeds for Cotton and Wool.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

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Boston Belting Co., Boston, Mass.
Hammer, C H & Co., Philadelphia.
Jeffrey Manufacturing Co., Columbus, Ohio.
Link Belt Machinery Co., Chicago, Ill.
Popham, Henry, & Son, Newark, New Jersey.
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Belt Dressing.
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Cling Surface Co., 168 Virginia St., Buffalo, N. Y.
Stephenson Mfg. Co., Albany, N. Y.

Belt Hooks.
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Roessler & Hasslacher Chemical Co, 100 William St, New York.

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Parker, Henry Co., Springfield, Vt.
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Boiler Tube Cleaners.
Coggeshall Mfg. Co., 130 1-2 Liberty St., New York.

Boxes, Cloth Boards, Etc.
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Braiding Machinery.
New England Butt Co., Providence, R. I.
Thun & Janssen, Reading, Pa.

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Bridges.
The Berlin Iron Bridge Co., East Berlin, Conn.

Brushes.
Felton, S. A. & Son Co., Manchester, N. H

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Buildings (Steel).
The Berlin Iron Bridge Co., East Berlin, Conn

Burr Pickers.
Curtis & Marble Machine Co., Worcester Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

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Birch Brothers, Somerville, Mass.
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Granger Foundry & Machine Co., Providence, R. I.
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Phillips Co, The Thomas, Providence, R. I.
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Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Booth, Benj. & Co., Philadelphia.
Buck Card Clothing Co., Palmer, Mass.
Hammer, C. H. & Co., Philadelphia.
Leigh, Evan A, 35 Mason Building, Boston.

Card Grinding Machinery.
Hardy Machine Co., Biddeford, Me.
Roy, B. S, & Son, Worcester, Mass.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th S Phila. Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila. Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Cement "Dealers."
Warren Bros. Co., 143 Federal St., Boston.

Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.
Adriance, John S., 105 East 39th St., New York.

Clutches.
The Eastern Machinery Co., New Haven, Conn.
James Hunter Machine Co., North Adams, Mass.
American Tool & Machine Co., Boston, Mass.

Coal, (Authracite and Bituminous.)
Whitney & Kemmerer, 143 Liberty St., N.Y

Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.

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Copper (Perforated.)
See under Perforated Metal.

Copper Print Rollers.
New Bedford Copper Co, New Bedford Mass.
Phillips Co, The Thomas, Providence, R. I.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co., Philadelphia.
Buckhard, Thomas, 494 Flushing Ave., Brooklyn, N. Y.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.

Corrugated Iron Shutters.
The Berlin Iron Bridge Co., East Berlin, Conn.

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Stoddard, Haserick, Richards & Co., Boston.

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Buffalo Forge Co., Buffalo, N. Y.
Link Belt Machines Co., Chicago, Ill.

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Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
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Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
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Schofield, Geo. L., Philadelphia.
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Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

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Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y

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Moore, Benj. & Co., Brooklyn, N. Y.

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Freund, Eugene F, 140 Maiden Lane, New York.

Dextrine.
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Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
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Dyers, Bleachers and Finishers.
American Yarn Printing Works, 134-150 North 22d St., Philadelphia.
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Cranston Worsted Mills (yarns), Bristol R. I.
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Firth & Foster Co, Kensington, Pa.
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Lorimers, The Wm. H. & Sons Co., Phila.
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New England Thread Co, Pawtucket, R. I.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Philadelphia Linen Finishing Co., Frankfort, Philadelphia.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

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Hopkins, Machine Works, Bridgeton, R. I.
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Knapp, C. H., Paterson, N. J.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co., Springfield, Vt.
Peel, Samuel H. Germantown, Philadelphia Pa.
Phenix Iron Foundry, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
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Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Weihe, H. C. Philadelphia.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

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Warren Bros., 143 Federal St., Boston.

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Bailey, Frank, Cedar Brook, New Jersey.
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Johnson, Wm. G, & Co, Uncasville, Conn.
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Dixon Lubricating Saddle Co., Bristol, R. I.

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Screens (Perforated.)
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Sewing Machines and Supplies.
American Machine Co., 420 Library St., Phila.
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Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Rusden Machine Co., Warren, R. I.
Standard Sewing Machine Co, Cleveland, Ohio.
Scott & Williams, 6th and Arch Sts, Phila, Pa.

Shearing Machinery.
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Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
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Shuttles.
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Butterworth, H. W. Sons Co, Philadelphia.
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Sturtevant, B. F. & Co., Boston.

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Weimar Bros, 1817 East York St, Phila, Pa.

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Mianus Electric Co., Mianus, Conn.
Philadelphia Electric Construction Co., Philadelphia.
Plummer, F. O. 620 Atlantic Ave., Boston.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
Ameledema Oilless Bearing Co., Wayne, Junc., Phila. Pa.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Lee-Odlum Co., Memphis, Tenn.

Trimmers.
The American Machine Co., 420 Library St., Philadelphia.
Excelsior Sewing Machine Co, Philadelphia.

Turbines.
(See Water Wheels.)

Valves—Rubber.
Boston Belting Co., Boston, Mass.

Ventilating Apparatus.
Allington & Curtis Mfg. Co., Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston.
American Blower Co., Detroit, Mich.
Berger Bros. Co., 231-237 Arch St., Philadelphia.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Gosline, D. P., Boston.
Mattern, Geo. 44 East 8th St., New York.
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New York Blower Co., New York.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

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Butterworth, H. W. & Sons Co., Philadelphia.
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Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co , Warren, R. I.

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Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 127 Duane St., New York.
Philadelphia Electric Construction Co., 1328 Chestnut St., Philadelphia.
Waggoner Watchman Clock Co , Grand Rapids, Mich.

Waterproof Floors.
Warren Bros. Co., 143 Federal St., Boston.

Water Wheels.
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Christiana Machine Co., Christiana, Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

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Bradway, C. P, West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.

Winders. (Hosiery.)
Universal Winding Co, 226 Devonshire St, Boston.

Wire Cloth.
Fraser & Chalmer, Chicago, Ill.

Wood Pulleys.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool Cleaning Compound.
India Alkali Works, Boston.

Wool Combing Machinery.
Crompton & Knowles Loom Works, Worcester. Mass.
Leigh, Evan A. 35 Mason Bldg., Boston.

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Garfield Woolen Co, Garfield, N. J.

Wool and Waste Dusters.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
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Butterworth, H. W. Sons Co., Philadelphia.
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Hunter, Jas, Machine Co, No. Adams, Mass.
Hunter, Robert 1525 Clearfield St., Frankford, Phila.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
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Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Roy, B. S. & Son, Worcester, Mass.
Rusden Machine Co., Warren, R. I.
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Schofield, Geo. L., Philadelphia.
Smethurst, Geo. (Gears for Mules), Maynard, Mass.
Stoddard, Raserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.

Wool, Hair and Noils.
Becker, Chas. W, Agt, Amsterdam, N. Y.
Fowles & Co, 106 Church St, Phila.

Wool Shoddies.
Becker, Chas. W, Agt, Amsterdam, N. Y
Garfield Woolen Co, Garfield, N. J.
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Frost, Geo. T , Paterson, N. J.
Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
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Whittier Cotton Mills, Lowell, Mass.

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American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Catlin & Co, New York and Boston.
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Spring St., N. Y.
Eichmann & Sternberg, New York.
Germantown Spinning Co, Germantown. Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
New England Cotton Yarn Co , New Bedford, Mass.
New England Thread Co., Pawtucket, R. I.
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—*Pennsylvania, West Bethlehem. P. A. Young of this place has purchased the plant of the Aquashicola Silk Mfg. Co. He has not yet fully decided whether the plant will be removed to Hellertown, or Walnutport.

—Utah, Logan. The Cache Knitting Works have been incorporated with a capital stock of $25,000 by J. A. Hendrickson, who is president; E. T. Lloyd, vice-president; Oscar Bjorkman, secretary and treasurer.

—*Texas, Denison. J. C. Atkins and associates have purchased a controlling interest in the plant of the American Cotton Spinning Co., recently organized to equip and operate the Denison Cotton Mill. This mill will now be run in connection with the Wyoming Valley Lace Mills, at Wilkesbarre, where the above men are interested in business. The plant will soon be put in operation. J. A. Smith will be the manager at Denison.

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1683 **Woolen Supt.** Large experience. Last mill where he was employed was for five years overseer and 15 as superintendent. A good man on flannels, sackings, skirtings, woolen dress goods and domestic woolen goods. Well up in weaving, dyeing, carding, etc., and has a general knowledge of all departments in a Western woolen mill. Englishman; married. Refers to past employers.

1674 **Supt.** or assistant in woolen mill. 10 years' experience on cassimeres, cloakings, etc. Well posted on shoddies. First-class references. Strictly temperate. Age 29; American; single.

1386 **Woolen Superintendent or** Boss Carder. Age 43; American. Familiar with the manufacture of all kinds of woolen goods, is well recommended, and can go immediately.

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1387 **Woolen Superintendent,** one who has had a thorough practical experience in setting up and operating woolen mills. Would take charge of small mill or finishing department in large mill. Now employed but wishes to change. Correspondence solicited.

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1700 **Supt.** of small mill, or carder in a large one. Has had twenty years' experience in the different rooms on plain and colored goods. Age 35; married. Strictly temperate. References first class. Now employed, but could take a place at short notice.

1686 **Cotton Supt.** Age 53; American; married. Large experience. Been in present position as superintendent for a number of years and previously in the same mill as overseer of weaving. Nearly all kinds of goods. Is familiar with nearly all makes of machinery. Refers to past employers.

1706 **Cotton Supt.** Age 39; American. Has started several small mills. Understands business from bale cotton to finished cloth. Has made yarns from 8's to 26's run into plaids, ginghams, etc., and is familiar with most all machinery. Can furnish references. Prefers Southern States.

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1653 **Supt.** of a small mill, or overseer of carding and spinning in a large mill. Has had seven years' experience as overseer and supt. in good mills. Is thoroughly posted on both gray and colored work. Has a thorough knowledge of designing, and understands all makes of machinery. Married, and good habits. At present employed as assistant superintendent in the South.

1673 **Cotton Supt., Carder, and Spinner.** Age 25; English; single. Large experience in English mills. Can take position at once. Has worked on all kinds of cotton machinery.

1671 **Supt.** desires position in Southern States as supt. of cotton mill or overseer in large room, any department. Age 42; married. Has had experience on all classes of white and colored work, both North and South. Has been South twenty years. At present employed, but wants better position. Best of references.

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1600 **Boss Woolen Carder** or would take a good secondhand job. Now employed, but desires to change for good reasons. Many years' experience in mills on American and English carding machinery. Age 41; American, married. Can start at once.

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1707 **Overseer of Carding.** Worked for 21 years in a woolen mill as boss carder, but through sickness was obliged to resign his position. Is now ready and wants a situation at once. Age 49; American; married. Wants $3 a day. Has worked on dress goods and flannels.

1643 **Woolen Carder.** Age 45; American; married. Has worked as overseer in first-class N. E. mills for the past 18 years. He is at present employed, but wishes to better himself. Could leave on a week's notice. Has worked on cassimeres, dress goods, flannels and underwear. A good manager of help and thoroughly competent and reliable.

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COTTON CARDERS.

1403 **Cotton Carder** with 17 years experience in N. E. mills as overseer and second hand, now in the South but wants to return North. Has never worked for less than $3.00 but would take $2 50 to change. Married. Age 38. Best of references.

1662 **Overseer Cotton Card Room.** Age 52; American, married. Not employed at present and could take a position at once. Has worked on all kinds of goods in order mills, and is familiar with all kinds of machinery. Refers to former employers.

1593 **Overseer Cotton Carding and Combing.** Now in charg of this department in a large N E. mill. Has had first-class experience and is well recommended. Age 38; married, American. All grades of cotton.

1718 **Second-Hand in Cotton Card** Room. Has had 10 years' experience in N. E. mill. Understands all makes of machines. Can make all changes from 1 to 20 hank. Has taken course in cotton spinning at American Correspondence School of Textiles, New Bedford. First-class references. Would start at $2 00 a day. Young man and strictly temperate.

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1648 **Boss Woolen Spinner.** 47 years old. 28 years' experience. Worked on all kind of stock, from ¼ to 12 run. Temperate, steady, and refers to past employers. Will work for moderate salary. Not employed and could come at once. Experience on cassimeres, flannels, beavers, knit goods dress goods, blankets, shawls.

1519 **Overseer of Woolen Spinning.** Age 31; married. Has worked on yarns from 1 run down to 5½. Some experience on shoddy. Will work for moderate salary.

1595 **Overseer Worsted Spinning.** 10 years as overseer of spinning, twisting, reeling, dressing, spooling on worsted yarns Englishman; age 41, married. Now employed, but does not like section of country. A first-class man in every respect.

1709 **Worsted Spinner or Section** Hand. Age 22 and unmarried. At present employed, but not satisfied with surroundings. Would accept moderate pay.

1601 **Woolen Spinner**, or painter and glazer in any kind of mill. Age 31; Irish; married. Wants $10 50 per week. Has worked on cheviots, overcoatings, broadcloths, satinets, hosiery, yarns, etc.

1647 **Overseer Cotton Mule Spinning.** Seven years' experience as secondhand. Wishes to get an overseer's job. Prefers Mason mules. Age 38; Catholic, married. At present employed. Experience on prints, sateens, lawns, twills, etc. Will work for moderate salary.

COTTON SPINNERS.

1636 **Overseer Cotton Spinning, Spooling, Warping, Etc.** Has held position seven years of second-hand and has taken textile school courses. Having had unusual opportunities to learn, he feels competent to take position as overseer. Highly recommended by present employers.

1655 **Overseer of Cotton Spinning.** 42 years old; married. Experience as a spinner covers a period of 30 years in first-class N. E. mills. Has worked principally on fine yarns, 30's t 200's. Had some experience on coarse numbers. First-class references.

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1663 **Overseer Mule Room.** Eleven years' experience in Fall River mills, and for the past ten years overseer of mule room. Excellent reference from present employer. Age 44, married.

1698 **Overseer of Mules.** 34 years old; married; English. 10 years' experience, chiefly on English mules, on all grades of cotton yarn. Would like to get a large job.

1703 **Overseer Ring Spinning, Warping and Spooling.** Is experienced on white work from Nos. 4's to 30's. Is familiar with Whiton and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married.

1690 **Cotton Mule Spinner.** Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with.

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1654 **Boss Woolen Weaver.** Has had 12 years' experience as fixer and two years' as boss weaver. Has worked on fancy worsteds, cotton worsteds and coverts. Is familiar with Crompton & Knowles machines. Age 37; English, married. At present employed. Can take a position with two weeks' notice.

1482 **Weaver or Wool Sorter.** Has worked on cassimeres, cheviots, tricots, kerseys and cloakings. Good references.

1645 **Overseer Weaving.** Age 30; married, American. Has worked in weave room since he was 17 years old, as weaver, fixer and secondhand of weaving, except for a short time was traveling salesman. Has worked on ladies' dress goods, men's fine worsted suitings, overcoatings, cloakings, etc., on Crompton & Knowles and Jacquard looms. Excellent references.

1413 **Boss Weaver or Designer.** American; age 49. Has worked on beavers, kerseys, dress goods, cassimeres and all kinds of men's wear. Is also a good loom fixer.

1712 **Second-Hand or Overseer of** Weaving. Age 29; American; single. Has some knowledge of designing. Has worked on fancy worsteds, cassimeres and cheviots. Wants $2.50 per day to start with. Is familiar with Crompton & Knowles machines.

886 **Boss Weaver or Boss Weaver and Assistant Supt.** Age 46; married. Has had large experience, and worked on cassimeres, cloakings and dress goods. Had been in last position, in charge of weaving, for eight years.

1688 **Overseer of Weaving** in large mill, designer in small mill, or assistant designer in a large mill. Age 38; German; single. Has worked on beavers, chinchillas, fine cassimeres, fine fancy worsteds, ladies' dress goods, army goods, union cassimeres and other classes of goods. Strictly temperate and industrious.

COTTON WEAVERS.

1681 **Overseer or Secondhand of Cotton Weaving.** Has had long experience as loom fixer, secondhand and overseer, and can furnish excellent references. Has also had charge of cloth hall and drawing departments. With one mill was 15 years.

1687 **Overseer of Weaving.** Age 30; Scotch; married. Has worked on taffetas, grogran, satins, serges and grenadines, all kinds of plain and fancy cottons and lenos. Is familiar with Crompton & Knowles and Whitin looms. Wants $4 per day.

1668 **Overseer of Weaving.** Age 41; English; married. Has had large experience as loom fixer and secondhand of weaving, and is competent to take an overseer's job. Has worked on shirtings, sheetings, sateens, fancy lenos, and all grades of fine goods all the way from 2 to 2⅞ harness.

1652 **Overseer Cotton Weaving.** Worked on about all kinds of cotton goods. Age 41, American, married. At present employed in the South, but wants to change for a healthier locality. Refers to present and past employers.

1708 **Overseer of Weaving.** Has had 15 years' experience on 12 different kinds of looms and most all kinds of cotton goods. Has worked in some of the largest mills in the South.

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1084 **Overseer of Knitting and Finishing.** Age 33; married. Has just resigned position in the South on account of climate, and is ready to take place at once. Can furnish best of references.

1641 **Boss Knitter.** Has had 18 years' experience on hosiery, cotton, fine lisle, woolen, worsted, plaited and mixed stock, on ladies', misses' and infants', shaker, also on all kinds of half hose from 108 to 200 needle and from 12 to 42 gauge on latch needle underwear machines and has worked on spring needle machines. Age 33; American; married.

598 **Boss Knitter or Supt.** Age 48; married. Is thoroughly familiar with the manufacture of all classes of seamless hosiery, and can take any position at short notice.

1694 **Asst. Supt.** or foreman of finishing room. Age 30; married; American. Large experience in first class mills, and excellent references. Thoroughly understands the manufacture of children's, men's and ladies' flat and fleeced lined goods and underwear. Can repair all kinds of sewing machines and can take position at once.

1657 **Foreman Seamless Hosiery.** Age 39; American, married. At present employed, but can take a position at short notice. Has worked on cotton and woolen hosiery. Wants $4.00 per day.

1666 **Underwear Knitter or Supt.** 12 years' experience on ribbed underwear on all kinds of yarns. Has worked for present employer for six years. Age 40; American; married.

1717 **Knitting Machinist.** Age 31; American; married. Is familiar with Lamb, Leighton and Pepper knitting machines; Hepworth and Beattie loopers; Wheeler & Wilson and National button hole machines; Union button sewing machines; all seamers and felling machines; Singer, Wheeler & Wilson and Standard lacing machines. At present employed, but can take position on two week's notice.

DYERS.

1684 **Dyer.** Age 30. Been in business 12 years. Wants position at once. Will go anywhere. Is familiar with long chain, short skein and raw stock dyeing, and carpet warp.

1693 **Dyer.** English, of 30 years' experience on wool, fine worsted yarns, piece dyes, felt cloths, carpet yarns. Understands all the different kinds of indigo vats. Never yet been asked to show recommendations, never before being out of a position, only voluntarily. Would be willing to start in a small place and help to build it up. Understands making soap from all kinds of stock.

1702 **Dyer** or secondhand in hosiery or cloth mill. Age 26; American; married. Nine years' experience. Has worked on hosiery, wool, shoddy and mixed stock. Will work for moderate salary, and can take a position at once. Refers to past employers.

1704 **Boss Dyer.** Age 36; English; single. Is familiar with dyeing cotton yarn and warp both for bleaching, fulling and other purposes. Has dyed for the best firms in England also for export work.

1714 **Cotton Yarn Dyer.** Age 36; Scotch; married. Has had 15 years' experience on fast shades. Wants $4.00 to start.

DESIGNERS.

1635 **Designer** on colored cotton dress goods, and shirtings, and fancy worsted dress goods, piece dye, jacquard work in cotton, silk filling, also lappets. Would not consider position paying less than $1200 a year. Is at present employed in one of the leading mills, making fancy cotton, and is an especially bright young man. Early training in Scotland. Has been in this country about four years

1383 **English Woolen Designer.** 20 years in leading Yorkshire and Huddersfield mills as designer, supt. and weaver. Very large experience and would accept moderate salary in good mill. Age 36; married, English.

1621 **Designer or Assistant Supt.** on men's wear worsteds, cotton worsteds, overcoatings, cassimeres. High and low stock. Has been designer in several first-class mills. Age 34; married.

1672 **Designer, Overseer of Weaving,** or assistant supt. Age 26; English; single. Has worked in various mills in England and this country. Holds first honors diploma for weaving and designing (London City Guilds). Fancy worsteds, dress goods, colored and fancy cotton goods.

1622 **Designer or Assistant Supt.** in woolen mill. Has made a specialty of steamer rugs and plaid back dress goods. Will start at $3 a day. Desires to change from present position on account of wife's health. An excellent opportunity to secure a first-class man at moderate wages.

1591 **Designer** on fancy worsteds, cotton worsteds, fancy cassimeres, tweeds, fancy back overcoatings, etc. Experience in first-class N. E. mills. Age 30. At present employed, but can accept position at once.

FINISHERS.

1526 **Foreman of Finishing Room,** Folding Packing, etc Age 45; married; English. Has worked on white and colored goods and prints. Is acquainted with every kind of machinery used in his business. Has worked 11 years in this country. Can give good references.

1351 **Boss Woolen and Worsted Finisher** is looking for a position paying $3.50 or more. Age 31; Has worked on all classes of woolen and worsted goods. Can furnish excellent references.

1661 **Overseer of Finishing.** Age 53; American, married. Large experience, and is familiar with Parks & Woolson and Curtis & Marble machinery. Has worked on cotton unions, dress goods, cassimeres, beavers, kerseys, coverts, army goods and worsteds. Can furnish excellent references.

1658 **Overseer Woolen Finishing** Age 35; married. A number of years' experience as overseer in first-class N. E. mills. Worked principally on kerseys, meltons, unions and cassimeres, and is familiar with Curtis & Marble, Parks & Woolson and Cleveland machines. First-class references.

1716 **Finisher.** Age 29; English; married. Has worked as wet finisher, shearer, gigger, second-hand and overseer. Prefers a mill making cassimeres, worsteds, dress goods and face finished goods. A high grade of goods. Is familiar with all kinds of American and English finishing machinery, and can keep same in the best of repair. Prefers Eastern States. Can take position at one week's notice. Best of references.

MISCELLANEOUS.

1418 **Secretary** in superintendent's or office of overseer of weaving. Is familiar with books in use in all departments At present, makes out orders for goods from raw cotton, and follow to finished goods ready for shipment. Also keeps up stock of supplies of all kinds. Has re-arranged shipping and warehousing. Introduced and worked out his present system for running mill, which has proved successful.

1583 **Cloth Room Overseer.** A young man having good experience as overseer in plain and fancy mills desires to change. Has worked on nearly all classes of cotton goods, and is recommended as a first-class figurer and good manager of help. Can take charge of cloth department and shipping where both positions are combined, or would accept position as office assistant. American; married.

1711 **Mill Engineer and Draughtsman.** American; married. Would take up other responsible duties in connection with engineering work. References of the highest character, and salary expected quite reasonable.

1713 **Foreman of Picker Room, or** Painter for some mill and weaver in winter or any other winter work. Wants employment year around. Is an all around man in woolen mill. Has worked on beavers, blankets and fancy dress goods. Wants $2 per day to start.

1602 **Overseer of Cotton Mixing.** Is at present second-hand in cotton opening room of large N. E mill, and has had several years' experience in this position. Could handle this department satisfactorily. Good references. Age 28; married. American

1715 **Second-Hand in Cone Winding** or Spooling Room. Age 24; single Has worked on all kinds of White and colored yarns from 4 to 60. Is familiar with Foster, Broadbent and George W. Payne machinery.

1566 **Wanted by a good practical man,** a position as overseer of slashing, warping, beaming and spooling. Now employed, but would change for a position in a first class Northern mill.

1685 **Boss Dresser or Assistant Designer.** Has taken a thorough course in designing, and is well up in calculations and in the making of fancy men's wear goods of all kinds. Has worked in Scotland and three years in this country. His knowledge of yarn calculations and practical experience as dresser tender makes him well fitted to fill a position as boss dresser and to run a room in an up to date and efficient manner. or to fill a position as designer or assistant.

1695 A young man would like to obtain a position in some Southern cotton mill as assistant supt., or some such position. where he would have an opportunity to learn the business thoroughly. Has theoretical and some practical knowledge.

1639 **Silk Supt. or Boss Weaver.** Experience covers ribbons, piece goods, velvets, jacquard, plain and plaids Has had practical experience as loom fixer, designer and overseer. Early training in Germany and later in some of the best silk mills in this country. Also understands manufacture of corduroy.

1557 **Bleacher,** overseer or second hand. Well recommended, good training, reliable. Wants $2.50. Age 27; married.

Patents.

(Concluded from page 603.)

Fur-Cutting Machine. 646,265. John Derbohlaw, New York City.

Fibrous Materials, Machinery for Preparing for Spinning. 644,420. John Good, New York City.

Fabrics, Method of Knitting. 644,465. Geo. E. Rutledge, Chicago, Ill., assignor to the George D. Whitcomb Co., same place.

Fabric, Knitted. 644,466. Geo. E. Rutledge and Ulysses G. Lee, Chicago, Ill., assignors to the Geo. D. Whitcomb Company, same place.

Fabrics, Method of Forming Knitted. 644,467. Geo. E. Rutledge and Ulysses G. Lee, Chicago, Ill., assignors to the Geo. D. Whitcomb Co., same place.

Knitting Machine. 645,924. James E. Tuttle, Melrose, Mass., assignor to Chas. F. Murphy, Boston, Mass.

Knitting Machine, Circular. 645,708. Harry A. Houseman, Philadelphia, Pa., assignor to the Standard Machine Co., of Pennsylvania.

Knitting Machine, Circular. 645,676. Frank Wilcomb, Pawtucket, R. I., assignor to the Standard Machine Co., Philadelphia, Penn.

Knitting Machine. 645,332. Ferdinando Rosati, Milan, and Corradino Petrini and Ruggiero Petrini, Chieti, Italy, assignors to the Berliner Taxameter Gesellschaft, Francke & Co., Gesellschaft mit Beschrankter Haftung, Berlin, Germany.

Knitting Machine. 644,309. Albert White, Lowell, Mass.

Knitting Machine. 646,336. Louis N. D. Williams, Ashbourne, Pa., assignor of one-half to Robert W. Scott, Philadelphia, Pa.

Loom-Shuttle. 646,319. Daniel M. Seaton, New York City, assignor to the American Automatic Loom Co., same place.

Lap-Robe, Plush. 644,809. Joseph Stroock, New York City.

Loom Attachment. 644,984. Peter Lambert, Fall River, Mass.

Looms, Box-Motion for. 644,692. John W. Small, Haw River, N. C.

Looms, Shuttle-Box for. 644,958. Horace Wyman, Worcester, Mass., assignor to the Crompton & Knowles Loom Works, same place.

Looms, Shuttle Checking and Releasing Mechanism for. 645,030. Henry I. Harriman, New York City.

Loom-Shuttles, Tension Device for. 644,886. Fred Carpentier, Woonsocket, R. I.

Looms, Friction Warp-Rack for. 644,429. Wm. J. Irwin, New York City.

Looms, Heddle for. 644,371. Samuel Sewall, Tewksbury, Mass.

Loom. 645,525. George F. Hutchins, Worcester, Mass.

Looms, Protector Mechanism for. 645,411. Fred A. Whitmore, Hopedale, Mass., assignor to the Draper Co., same place and Portland, Me.

Loom. 645,637. Clinton Alvord, Worcester, Mass., assignor by mesne assignments to the Preston Hose and Tire Company, of Maine.

Looms, Shedding Mechanism for. 645,636. Clinton Alvord, Worcester, Mass., assignor by mesne assignments to the Preston Hose and Tire Company, of Maine.

Loom. 645,913. Henry W. Cray, May's Landing, N. J., assignor to the Draper Co., Portland, Me., and Hopedale, Mass.

Looms, Warp Stop-Motion for. 645,912. Alvah W. Clement, Hopedale, Mass., assignor to the Draper Company, Hopedale, Mass., and Portland, Me.

Looms, Indicator Mechanism for. 645,562. Harry Hardwick, Philadelphia, Pa.

Looms, Shuttle for. 645,695. Zephirin Thuot, Fall River, Mass.

Mercerizing, Apparatus for. 645,698. Leonard Weldon, Amsterdam, N. Y.

Measuring Device, Cloth. 645,652. Oliver E. Webber, Manning, S. C.

Spinning Apparatus. 645,915. G. O. Draper, Hopedale, Mass., assignor to the Draper Company, same place and Portland, Me.

Spinning, Self-Acting Mule for. 645,928. James Pickford, Oldham, England.

Spindle Bands, End-Holder for. 645,519. Wm. H. Bracewell, Fiskdale, Mass., assignor to the Draper Co., Hopedale, Mass., and Portland, Me.

Seed-Cotton Fan Machine. 644,145. Thos. J. Overstreet, Norman, Okla.

Spindle for Spinning, Twisting, Doubling and Winding Machines. 644,572. Carl Bergman, Meissen, Germany.

Spinning Machines, Top-Roll Saddle and Stirrup Therefor for. 646,258. John Bilsborough, Bristol, R. I., assignor of one-half to Joseph A. Prescott, Foxborough, Mass.

Winding Machines, Yarn-Clearer for. 646,025. Henry M. Girdwood, Salford, Eng.

Woven Fabric. 646,123. Martin Koeck, Oshkosh, Wis., assignor by mesne assignments to the Northwestern Grass Twine Co., St. Paul, Minn.

Warping Machines, Creel for. 645,376. Chas. Slingland and George F. Kuett, Paterson, N. J.

Woven Fabric. 645,318. Maud R. Hartz, Richmond, Va.

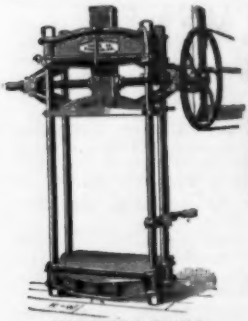
Weft-Replenishing Mechanism for Looms 645,897. Abram D. Emery, Taunton, Mass.

Yarn-Controller. 645,931. Thos. Ashworth, Urmston, England, assignor to John Shaw Gaunt, Manchester, England.

—*Mississippi, McComb City. Site has been purchased for the new mill at this place, and work will begin on construction of same during March. The capital stock has been increased to $150,000. Details concerning the plant were reported in a previous issue.

—*New York, Baldwinsville. It is reported that John Charles Miller, who purchased the knitting mill formerly operated by J. C. & J. C. Miller, intends to form a stock company for purpose of putting the plant in operation.

—*Oregon, Ashland. A proposition to form a company with capital of $30,000 and build mill on site of one destroyed by fire, operated and owned by E. K. & G. N. Anderson, is now being considered. J. R. Norris, E. A. Sherwin and J. R. Casey were appointed to canvass for $15,000, to be subscribed by the citizens, E. K. & G. N. Anderson, to furnish the site and balance of necessary capital.



KNUCKLE-JOINT.

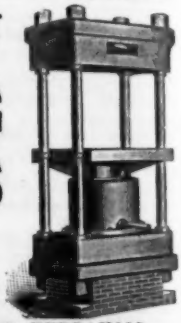
BOOMER & BOSCHERT

BALING PRESSES

ARE THE STANDARD.

Boomer & Boschert Press Co.

338 West Water St., SYRACUSE, N. Y.



HYDRAULIC.

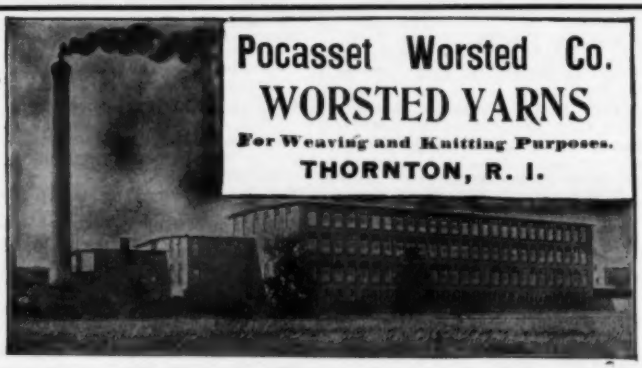
EASTON AND BURNHAM MACHINE CO.,

Pawtucket, R.I.

ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS

TO SPOOL FROM COP, SKEIN, OR BOBBIN.

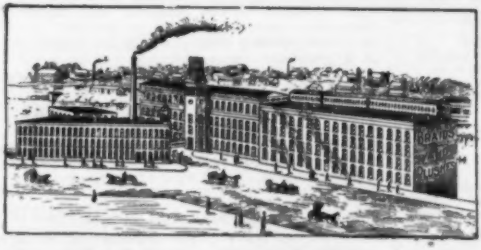


Pocasset Worsted Co.

WORSTED YARNS

For Weaving and Knitting Purposes.

THORNTON, R. I.



FLYER SPUN

Mohair and Worsted

YARNS.

Mohair Plushes,

Worsted and Cotton Braids.

D. COFF & SONS, Pawtucket, R. I.

—— ESTABLISHED 1861. ——

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn: Spinners continue busy with prices firmly maintained. There is much complaint by knitters who claim that the prices charged are unreasonably high. The spinners have taken advantage of the continued demand for cotton fleece-lined underwear and prices in consequence have been nearly doubled within the last year. The spinners have been reaping large profits. We hear of one mill in the South which has earned its capital in one year. The knitters are many of them putting in spinning machinery to protect themselves from these high and unreasonable prices. The weaving trade continues to use great quantities of yarn in almost all numbers from 2/6s to 2/40s. The price for 2/26s, a year ago, was 13 cents per pound, while today it is 27 cents per pound. The weavers, although very busy, claim that prices will be lower within a month or six weeks. Spinners are not expecting a decline before November. It certainly seems as though spinners would be able to maintain prices on account of the great demand for cotton worsted requiring this cotton yarn. The demand for cotton yarn is without parallel in the history of the woolen industry, brought about by the high prices for wool which have been prevailing. The spinners of combed Egyptian yarn have advanced prices to the breaking point. 1/20s combed Egyptian yarn has been advanced from 28 cents of one year ago to 42 cents per pound. This price the knitters say is prohibitive, and they are in consequence withdrawing their samples from the market. Buyers are asking if they can get this balbriggan underwear at 25 cents per dozen advance. The knitters are obliged to tell them that they must get $1.50 per dozen advance on the present price. Knitters own some of this class of yarn, but when this is used all will be forced off these goods, and will either use carded cotton or shut down. These prices are brought about largely by the cotton yarn trust, though also due to the actual scarcity of the cotton itself, on account of the ocean steamers being withdrawn for English transports. There is much dissatisfaction at the present state of affairs, and the high prices will undoubtedly aid the woolen manufacturers in the sale of all-wool goods.

Worsted Yarn: Spinners continue busy at present on orders taken early in the season, but indications point to a slack period. Already spinners of fine yarns are offering concessions, and prices refused a month ago are now gladly taken. The coarser qualities are holding their own and the present orders are all calling for yarns made out of 3/8 to 1/4 blood yarn in numbers ranging from 2/28 to 2/6. Weavers purchased more fine yarn than was required and now are forced on new styles with cheaper qualities and lower prices. It certainly looks as though weavers making the finer class of cloth will be forced to shut down unless orders begin to come forward in the next three or four weeks. The heavy-weight season, so far, is a great disappointment. The weavers expected a good demand for cloth out of fine worsted yarn, but the orders placed were almost wholly for cotton worsted and for cloths out of cheviot yarn. Some very heavy orders have been given for this class of yarn at very satisfactory prices. At the beginning of the season, buyers, realizing that an order meant nothing to them, ordered heavily, and after inspecting sample ends cancelled 40 per cent. of the orders placed. The woolen trust, it is reported in New York, suffered heavily from these cancellations and today have many looms idle. The

Frank E. Patterson, Prest. Oscar W. Wood,

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

W. Warren Thread Works,

SPOOL COTTON
on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use
on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns
on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

WESTFIELD, MASS.

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

226 Devonshire St., - Boston, Mass.

clothiers have refused to buy any cloth costing over $2.00 per yard, and have not taken much at that price. The weavers, finding themselves without orders at that price, made an entirely new line of samples out of the same material and are offering the same at 25 cents per yard under price. The only mills which are sold up are those manufacturing cotton worsted cloth, and these mills have more work than they can well attend to. The yarns for these cotton worsteds have advanced on certain lines from 13 cents per pound a year ago to 27 cents per pound today, and it is stated that the woolen mills have ordered so extensively of this yarn that if cotton yarn shows any material decline it will ruin many of the woolen manufacturers in the country. One or two of the large mills which owned fine yarn, better than a half-blood quality, by making low prices have sold up to jobbers who have not canceled orders to any extent. These styles have taken the place of the fine styles of the Rockville mills which have in consequence suffered. Australian yarns are being offered at least 10 cents per pound off from the highest price and in some instances the price has been much lower. Many of the mills owning high priced yarn, being unable to sell profitably, have taken on orders for cheviot cloths instead of their desired fine fancy worsteds. It is said, however, that within the next 60 days buyers must purchase more fine cloth, but at undoubtedly a lower range of prices. It is said that the light-weight goods are not selling as well as expected and that many of these cloths are being returned. The trust, it is said, have had 1000 cases returned. The cloaking manufacturers are placing some good orders for Oxford mixes in hard-twisted 2/6s, to manufacture pebble worsted overcoating. Some large orders have been placed for 1/8s. The astrachan manufacturers are beginning to be interested in lustre yarn and have many samples out for Oxford worsteds.

The dress goods manufacturers con-

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
306 Chestnut St., Philadelphia

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
74-78 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns,
Double and Twist Yarns for
the Weaving Trade.
PAWTUCKET, · R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

Eddy & Street,
COTTON, **YARNS** WORSTED,
AND
WOOLEN, **BRAIDS** SPUN SILK.
PROVIDENCE, R. I.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

WILLIAM FIRTH, PRESIDENT. FRANK B. COMINS, TREASURER.

AMERICAN MOISTENING COMPANY,

150 Devonshire St., Boston, Mass.

The "Drosophore" and "Vortex" Humidifiers.

Legal proceedings will at once be taken against infringers and users of infringements.

WE HAVE, WITH INSTALLATIONS IN HAND, ORDERS FOR OVER 2,000 HUMIDIFIERS.

YARNS

SOLIS : : BOSTON.

179 Devonshire Street.

ANDREW J. SOLIS, Jr. & CO.

COTTON YARNS

from 2s to 26s single and ply.
SPECIALTY—FIRE HOSE CORD and YARNS put up on tubes wound on Universal System.

WHITTIER COTTON MILLS, - - - - - - LOWELL, MASS.

INDIAN ORCHARD COMPANY,

Indian Orchard, Mass.

Manufacturers of - - - -

COTTON WARPS AND YARNS
In gray and all colors, single or in any twist.

COLORED COTTON
Machined, Carded or in Roving.

NOVELTY YARNS

In Cotton, Mercirized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.
We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.
We use a uniform grade of long stapled cotton in all our manufacture.

tinue busy and are using considerable yarn in 2/14s, 2/26s and 2/32s. This branch of the industry is using more worsted yarn than the men's wear. The spinners of French spun yarn continue busy, with good prospects for maintaining prices, and are securing good orders. Many of the knitters who have been heretofore well filled with orders are on the market to place orders at the going price. We note that the large French spun yarn mill is now in operation, and will undoubtedly relieve the short supply of these yarns. The top combers are beginning to feel the slack demand for tops and are running less freely. It is stated that buyers are using more woolen fabrics and consequently the worsted manufacturers will not be so busy. We look for a good business the coming season. The heavy-weights will be ordered late and prices will be lower for the fabrics. Boom prices will not prevail.

Woolen Yarn: Spinners continue busy, but cancellations are beginning to tell on production. Weavers who have bought more yarn than they can use are working hard to have orders cancelled as otherwise this yarn must be carried by them until another season. Of late, certain manufacturers have been ordering the purchase of stock for yarn for future delivery when prices have seemed to advance, and when a decline has taken place have tried to repudiate the orders. This has already failed one yarn spinner and the spinners are tiring of this treatment, and if those having ordered yarn do not fulfil their contracts, law suits will undoubtedly be the result. Knitters are placing orders for yarn as the occasion requires, and are securing concessions over the boom prices by five cents per pound. Spinners are having many orders for yarn to manufacture French flannels. This yarn is made very carefully, requiring white yarn, free from specks or imperfections of any kind.

We note a curious state of affairs among manufacturers. Instead of trying to bear prices, many seem anxious to have prices maintained, as many own wool at extreme rates. Knitters state they are thankful that prices have been maintained until they secured orders covering production. Large quantities of cotton continue to be used and wool noils and thread waste is also extensively worked. Wool noils are being firmly maintained on account of the demand. It is noted on the Boston wool market that dealers are working hard to hold prices. If a material decline occurs, dealers will lose money in large blocks. It is stated that the coming clip will be held for old prices and dealers will hold out of the market in consequence. The country banks in the West will encourage the farmers to hold out. The London wool sales

A. HERBST. J. W. JONES.
HERBST & JONES,
KENNEBEC WORSTED MILLS.
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

RICHARD CAMPION,
Selling Agent for—
Bristol Worsted Mills,
Highland Worsted Mills.
17 Bank Street, Philadelphia, Pa.

FRENCH AND BRADFORD SYSTEMS
B. F. BOYER & CO.,
WORSTED YARNS
IN WHITE AND MIXES.
Woolen and Merino Yarns
OFFICE AND MILL
Delaware and Cooper Sts.
Camden, N. J.

NEW ENGLAND THREAD CO.,

MANUFACTURERS OF

SPOOL COTTON IN NUMBERS FROM 8 to 100,

In All Grades and Lengths on Spools and Tubes.

Seaming Yarns on Cones; Polished Threads and Yarns on Bobbins.

DYEING AND BLEACHING of All Kinds of Yarns and Narrow Fabric a Specialty. Best of Spring Water for Bleaching.

PAWTUCKET, R. I.

Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, **Philadelphia, Pa.**

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Manufacturers of

Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS

Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL, WORSTED, MOHAIR AND SILK.

Cotton Warps. ON BEAMS, JACK SPOOLS AND TUBES. IN FANCY TWIST COLORS AND PRINTED.

HAYES, O. H. & CO.

Representative Lines of Woolens

O. H. HAYES & CO.

Liberal arrangements made with manufacturers or men controlling mills' productions.

ended the 24th of March. Over 110,000 bales were withdrawn from the market and the sales ended with a decline as compared with close of last series, of 15 per cent. This makes about 20 to 30 per cent. since January 1st. We have just received an interesting letter from France, which we will quote to show the condition of affairs in Europe:—

"The decline has not made itself felt as quickly as we expected. There is in Europe a very great interest in maintaining prices of wool caused by the high prices paid in the last month of 1899. As a consequence the importers do all they can to protect rates. Thread waste in fine quality is much sought after for America and this demand has caused this merchandise to be firmly held." We may deduct from the present situation that dealers of wool both in this country and in Europe own wool at high prices which eventually they must sell at low prices, and it will therefore not be easy to secure the full decline until they are forced to part with wool for financial or other reasons.

To show how the importers are fighting to maintain prices, we quote the following, under date of March 15th:—

"The second series of sales opened under unfavorable circumstances. Great hesitation was shown on the part of dealers and prices declined 10 per cent. With better selection prices regained 3 to 5 per cent. of previous fall. Owners, confident of the future, intend to withdraw large quantities, and the third series, which opens May 8th, will have a net available amount of 170,000 bales, which, with the 110,000 bales withdrawn, will make 280,000 bales to offer. America bought 10,000 bales at the sales just closed. Buyers are operating cautiously and mills are trying to sell holdings of fine wool purchased in November at lower prices. We believe the spinners will have a good steady business when the demand begins to be felt, but there will be no more booms until after November."

WAVERLY WORSTED CO.
SPINNERS OF
WORSTED YARNS
FOR WEAVING AND KNITTING.
Main St. & Green Lane, Manayunk, Philadelphia.

DAVIDSON & BROOKE,
ORIANNA BLEACH WORKS,
Bleachers
Of Turkish Towels, Cotton Yarns, Underwear, Tapes and Hosiery.
2562-62-64 No. 3rd St., PHILA., PA.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Mercerized, Turkey Red, Bassed } Cotton Yarns.
Jacquard and Harness Twines.

Philadelphia Yarn Market.

The prices on cotton have remained firm, with an upward tendency, since our last report, and the demand for yarn has continued good, and some advances are noted. There is every prospect now of continued good prices until fall, as most mills are sold up practically. Of course, with the immense amount of yarn to be delivered, at the prices now prevailing, there will be very little pressure to sell, which should keep prices firm.

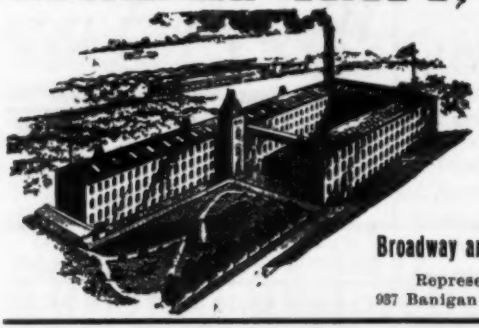
While the new crop of cotton will probably be large, this fact can never be definitely ascertained, until it is marketed, and no matter how large it is, there will be plenty of mills out of cotton, and ready to take all that is offered, when the crop commences coming in.

Both Eastern and Southern yarns are held considerably above list price, except inferior grades. We quote the following as about today's prices:—

Warps:—

20/1	21
22/1	21½ to 22
26s	22½ to 23
16s	20
14s	19 to 19½
14/2	20 to 21
16/2	21½ to 22
20/2	23 to 23½
30/2	30

HOWLAND CROFT, SONS & CO.



LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD,
937 Banigan Building, Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

Worsted YARNS,

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

...Dyers of Yarn and Slubbing...

BRISTOL, R. I.

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 220 CHESTNUT ST., PHILA.

40/2	39 to 40
8/3	16½ to 17

Skein:—

8s to 10s soft	16½ to 17
14/1	19
16/1	19½
20s	20 to 21
19s	20 to 21
8/3	16
14/2	20
16/2	20½
20/2	22½ to 23
30/2	30
9/4 slack	18 to 18½
8/2 soft	18
12/3	18½
16/3	19

Southern cones (various qualities):—

6s to 8s	18 to 18½
10s	18½ to 19
14s	19½ to 20
18s	20½ to 21½
20s	21 to 22
22s	21½ to 22½
24s	23½ to 24½
30s	27½ to 28½
40s	34 to 35

Shuttle cops:—

6s to 8s	16½ to 17
10s	17 to 17½
12s	17½ to 18
16s	18 to 19

Eastern hosiery yarn, basis 19¼c. to 19½c. for 10s cones. Rise ¼c. per number to 15s.

Combed Egyptian yarns have been advanced to prices that are in many instances prohibitive.

Worsted yarn is easier to some extent; it is being offered at 2c. to 3c. lower.

The demand for woolen and merino yarn is still good. The price of wool is somewhat easier and the market for cloths has eased off a trifle.

—The history of civilization teaches us that it has never been possible to stop progress if it is genuine.

—Every dyestuff requires its own particular treatment in order to obtain the best results possible, and the intelligent dyer will find this out sooner or later.

—In all probability the art of dyeing indigo was transferred from there into ancient Egypt, following the tracks of commerce, and was then further transplanted to Phœnicia and Italy.

—So far as we know, there do not exist any manuscripts on dyeing written by the Greeks or Romans.

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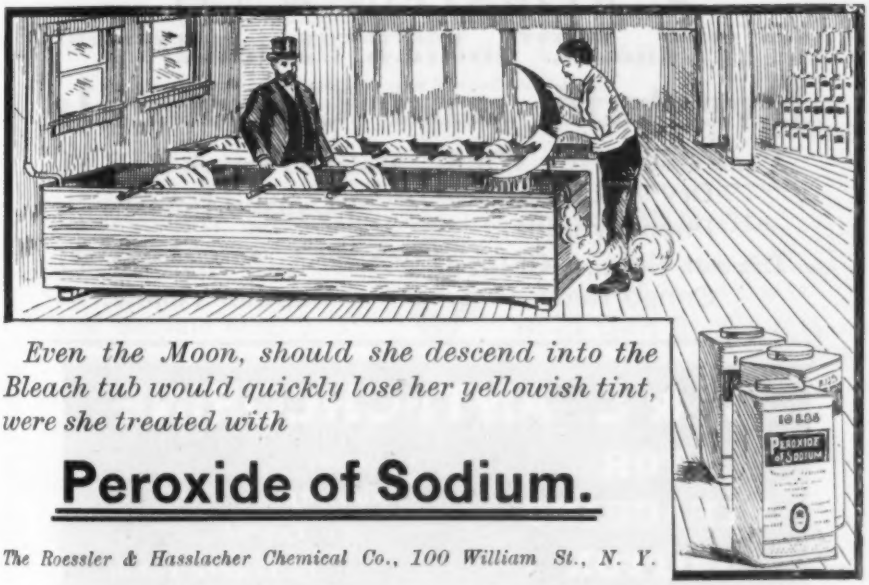

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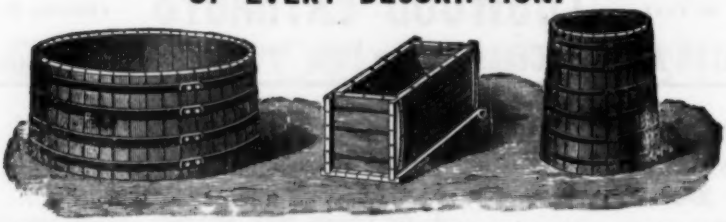

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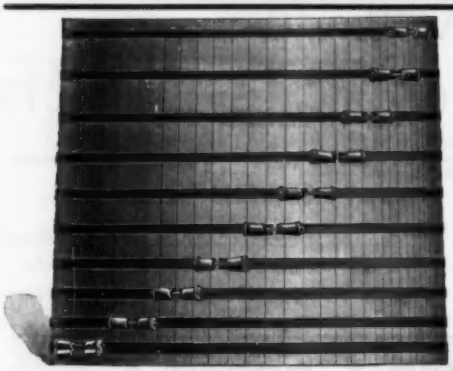

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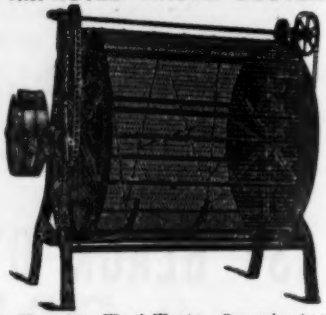

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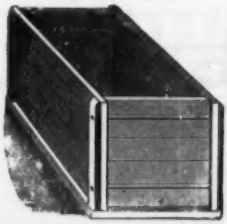

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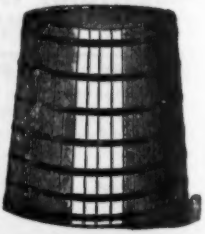

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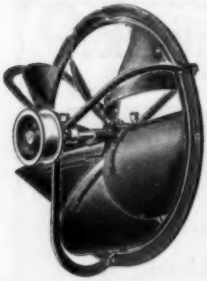

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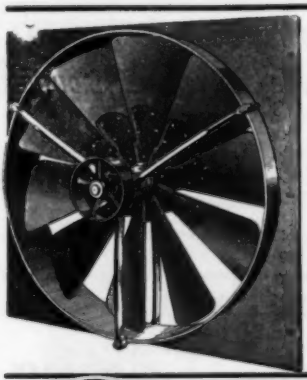

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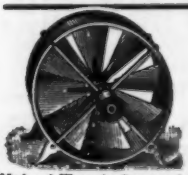

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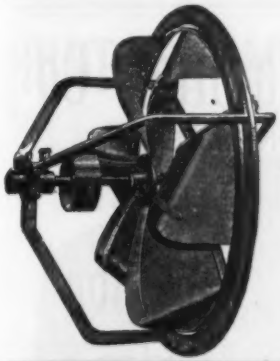

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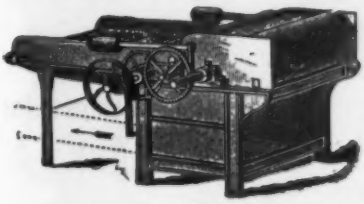

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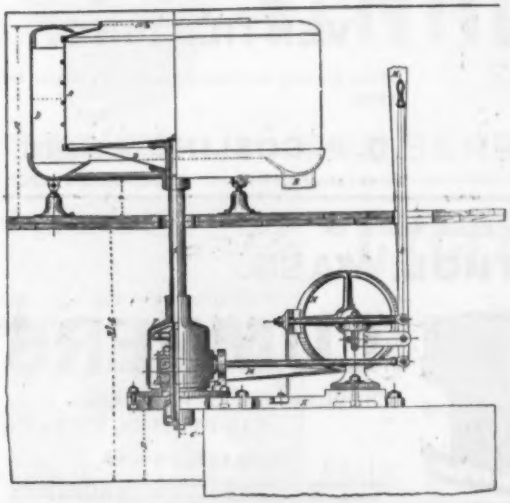

Manufacturers of

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Special Machines for Acid Work.

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Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
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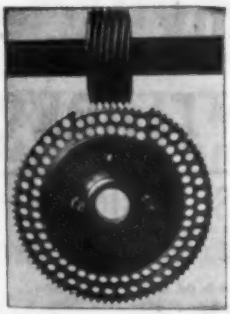

Improved Roping Gear for Woolen Mules and Operators.

This gear is sure to start on time. It will not pay out more roping than required. It prevents heavy yarn from this cause. The mule will gear free. The rolls cannot bind. The yielding section is so made that it cannot get out of order, Spinners have nothing but praise for it. Already adapted by leading mills.

Price $3.00. Sent on approval for trial.

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HUNTER'S IMPROVED CLOTH WASHER

For Four, Six and Eight Strings of Goods.

Power transmitted by means of a Friction Pulley.
No Shifting of Belt to start and stop the machine.
Less power required than for any other Washer of equal capacity.
All Main Bearings are adjustable. All Bearings are on the outside of frames.
No dripping of Oil on the Goods, or in the Wash Box.

Also Combination Washer and Fuller for Knit Goods in the String.

Write for further particulars and prices

JAMES HUNTER MACHINE CO.,

North Adams, Mass.

Boston Office, Room 67, Mason Building, 70 Kilby St.

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The American Napping Machine Co.

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CHAS. HEAP, U. S. N. M. CO., and
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Combining the Latest FRENCH, ENGLISH and AMERICAN IMPROVEMENTS.
Manufacturers are Cautioned against Buying or Using Infringing Machines.

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FOR COTTON, WOOLEN, WORSTED, PLUSH GOODS, ETC.
SHEARING MACHINES A SPECIALTY.

Send for Descriptive Catalogue.
New Works, 56 Cambridge St., near Webster Sq. WORCESTER, MASS.

IMPORTANT IMPROVEMENT IN WORSTED SPINNING.

The Bamford Dust Proof and Self-Lubricating Spindle Tube saves oil, prevents clogging with dust and lint, thereby insuring longer life to the tubes, saves labor, maintains uniform speed, and most important of all, makes PERFECT YARN. Refer to largest worsted mills.

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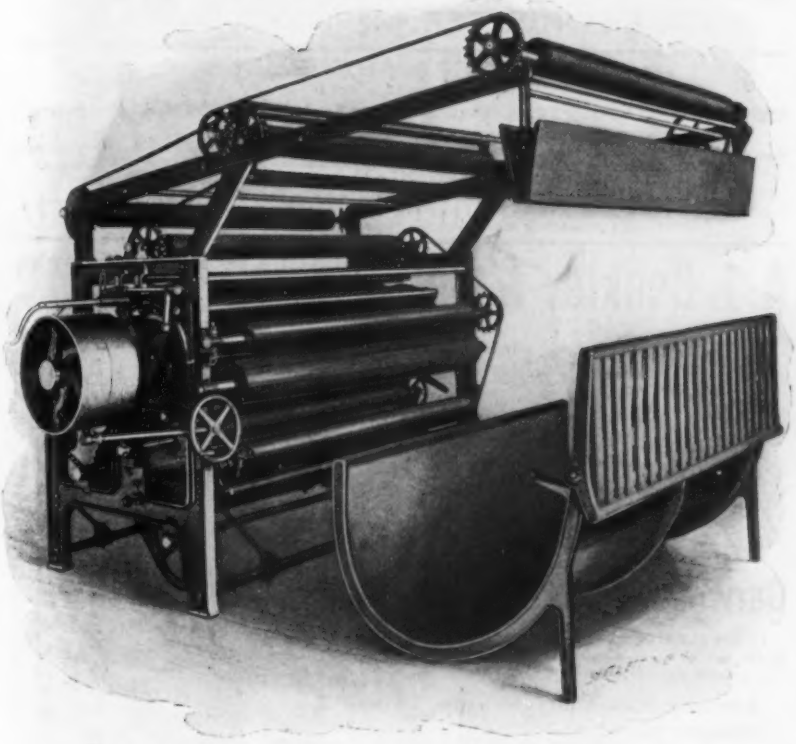
ALSO MFRS. OF
STEEL CAPS AND SPINDLES.
CAPS, FLYERS, TUBES, Etc., REPAIRED.

RILEY'S PATENT RIGGING CUTTLING FOLDING MACHINES
For all kinds of Gray or Finished Stuffs, Woolens, Worsteds, etc.
CHAS. A. JOHNSON & CO. { SOLE AMERICAN AGENTS.
New York and Providence.

Cloth Washers, Fulling Mills, Piece Dyeing Machines, etc.
You want the best, We build them.
HOPKINS MACHINE WORKS,
BRIDGETON, - - R. I.

NO. 3 NAPPER.

IT HAS COME TO STAY.

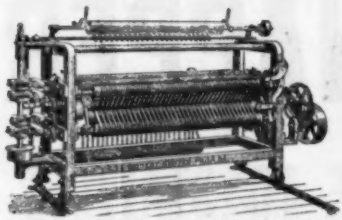


We have a new descriptive circular. Do you want to see it? A postal card will do it.

PARKS & WOOLSON MACHINE CO.,

SPRINGFIELD, VERMONT.

The Latest Improved Bolette Condenser.



My machine embodies the results of long practical experience with the Bolette system. This system is acknowledged superior to any other condenser on the market. It is universally employed in Europe and very largely by the best woolen manufacturers in this country. The merits of the Bolette system are too well known to need discussion, and the object of this advertisement is to impress upon woolen manufacturers that my latest improved Bolette is the best on the market. It is less complicated, stronger and more readily handled than other makes. It is perfect in mechanical construction, and made to absolute standard sizes. Gears are covered with safety gates.

I can also supply the best imported and domestic perforated and corrugated aprons for any rub motion.

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Manufacturers of

Woolen Drying and Finishing Machinery,

INCLUDING

Kenyon's Patent Tentering and Drying Machines on Pipe System, Hot Air Dryers and Tentering Machines, Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Soaping Machines, Wringing Machines, Yorkshire Gigs, Dyeing Machines for Piece Goods, Friction Clutches, Jigs, double or single; Brush and Pumicing Machines for Worsteds, Dewing Machines.

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PERFORATED COPPER

For Wool Scouring, Renser Boxes and Dyers of Raw Cotton.

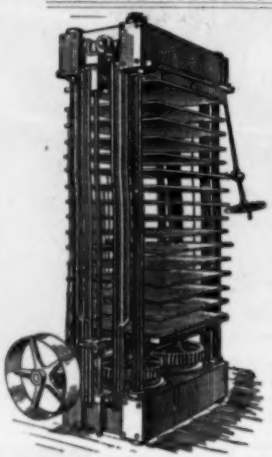
Screens Especially for the Woolen Mills. . . . .

Correspondence solicited.

Reliance Machine Works,

...Manufacturers of the...

RELIANCE HOSIERY PRESS.



Hot Plate Screw Press for Hosiery Trade.

Write for Prices and Particulars.

CHAS. HART,

Cor. Hedge and Brown Sts., FRANKFORD, PHILADELPHIA.

THE

CRAWFORD Hollow Steam Plate Press

FOR KNIT OR WOOLEN GOODS

The most reliable machine of the kind on the market.

J. J. Crawford & Son, Nashua, N. H.

IF YOU WANT COTTON OR WOOLEN MACHINERY

...Why not correspond with...

GEO. L. SCHOFIELD,

123 No. Front Street,

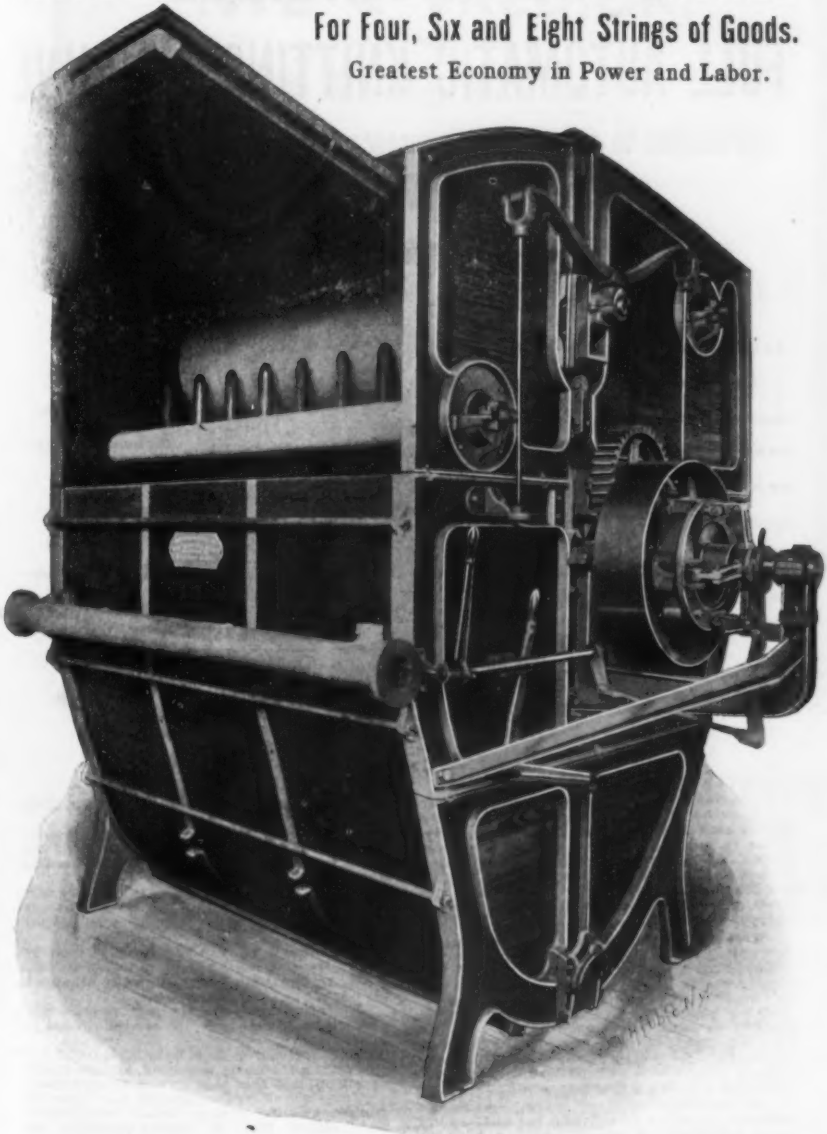
PHILA., PA.

Also, Agent for the Weston Hydro Extractor.

LATEST IMPROVED CLOTH WASHER

For Four, Six and Eight Strings of Goods.

Greatest Economy in Power and Labor.



Unequaled for Capacity and Rapid Washing

All Kinds of Heavy and Light Goods are Desired.

Attachment for Washing and Fulling Knit Goods in the String.

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Long Distance Telephone. Send for New Illustrated Catalogue. Telephone No. 1522.

THE INVINCIBLE

FULL AUTOMATIC KNITTING MACHINE

IS ADAPTED TO THE ECONOMICAL PRODUCTION OF ALL CLASSES OF SEAMLESS HOSIERY.

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It is the only Automatic machine made to be fastened to a bench, occupying no more space than semi-automatic machines.

• • •

It has a simple and positive attachment for putting in and taking out an extra thread in heel and toe automatically.

• • •

A simple and positive attachment can be applied for **making high spliced heels and double soles automatically,** at the same time the heel and toe are reinforced by an extra thread. The splicing arrangement is supplied with yarn from a bobbin holding a quantity of yarn, and not from a small cop such as is usually used in devices of this kind.

The only successful yarn changer is applied to this machine. This device changes the yarn automatically at heel and toe, or at any desired point in the knitting of the stocking. It does not require a revolving bobbin which is commonly used in similar devices, but allows the use of a full size winder bobbin or cone for each yarn used. It is perfectly positive in its operation, is simple and well built, and is recommended as filling a popular demand.

In knitting "string work," **a loose course** is put in as a guide for cutting off each stocking. **A loose course can be be put in for looping** the toes. This is a great advantage in fine gauges.

Attention is invited to the new method of transferring tops to the needles of machine in knitting Half Hose, and in footing ribbed leg hose.

The method of doing this is entirely new, and must not be confounded with the ordinary method of transferring with a quill ring.

The speed of the machine is reduced just before changing from circular to reciprocatory knitting, thus avoiding all shock. All parts are interchangeable.

By changing cylinders only, the machine will make either fine or coarse gauge of goods.

The Invincible is a compact, light running, full automatic machine, simple in construction, has few parts, runs at high speed, occupies small space, and is put upon the market at a price that defies competition from either full or semi-automatic machines.

E. JENCKES M'F'G. CO.

It may be seen in operation either at our **Factory, at Pawtucket, R. I., U. S. A.** or at our branch office, ROOM 370, BOURSE BUILDING, PHILADELPHIA, PA., U. S. A. Correspondence invited. Location at National Exposition, EX. P-7—H.

NYE & TREDICK,

MANUFACTURERS OF

Circular Rib Knitting Machinery,

Underwear Machinery,

For Ladies' Vests, Combination Suits, Corset Covers, etc.
Men's Underwear, Sweaters, etc.

New Improved Sleeve Machines.

Machines for Rib Hosiery, Rib Tops and Cuffs.

LATEST IMPROVEMENTS ON ALL MACHINES.

MECHANICAL STOP MOTIONS
FOR CIRCULAR RIB KNITTING MACHINES.

OFFICE AND SHOWROOMS:

606 Arch Street, - PHILADELPHIA.

SOMETHING NEW

The Elastic Web Callendering Machine for Finishing .....

GARTERS, SUSPENDERS, ETC.

Shrinks and sizes the goods on both sides.
Send for full particulars and prices to

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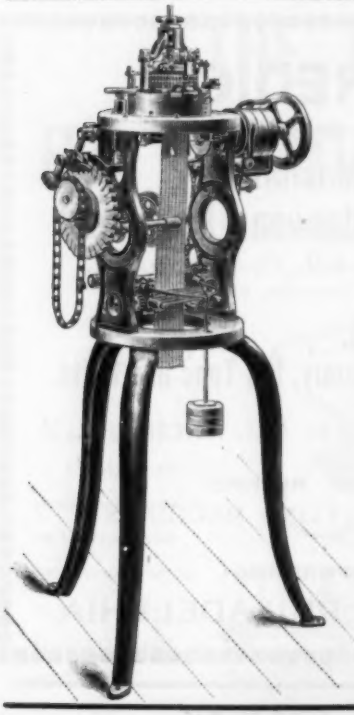

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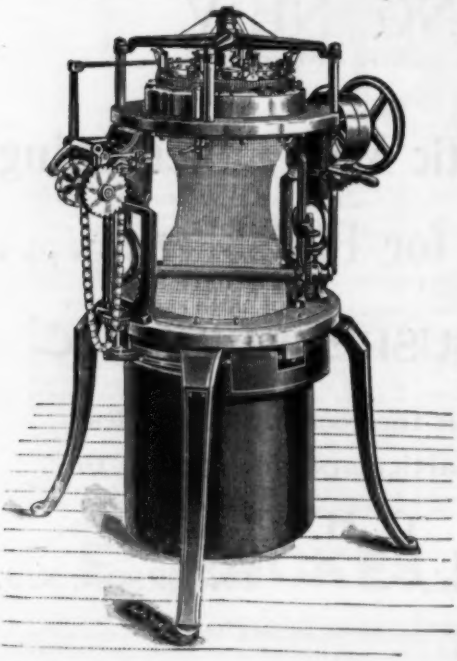
Improved High Speed

Single Feed Automatic Ribber

With Welt and Slack Course for Half Hose Tops and Rib Legs, Etc.



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RIB KNITTING MACHINERY,

AUTOMATIC AND PLAIN,

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.

ESTABLISHED REPUTATION FOR

Largest Production. Best Quality Fabric, Durability, Economy of Operation.

Full particulars, Description and Samples furnished upon Application to the

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BRANSON MACHINE CO.

... BUILDERS OF ...

Knitting Machinery.

Hand
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Power,
Open Top
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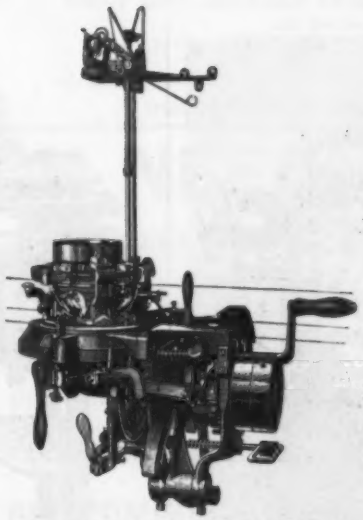
1/2 3/4
or



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Ribbers.
Loopers and
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Estimates
for Plants
Complete.

Branson 7-8 Automatic Knitting Machine.

7/8 Automatic Knitters,

All Sizes and All Gauges.

WINDERS and BOBBINS. HAND FORGED STEEL CYLINDERS.

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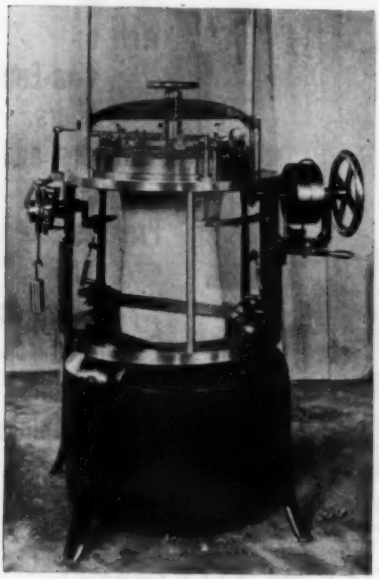
Circular Rib Machines

Of Highest Speed, Less Needle Breakage, Less Seconds, Largest Production.



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STRIPER FOR RIB GOODS.
24 feeds. Cut 14 to inch.

THE UNIVERSAL CLOTH TURNER
with radical improvements.

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for steaming, pressing and drying in the roll.

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Our machine are all of new design from new patterns and of best material and good workmanship and sold at fair prices. Send for catalogue and estimates.

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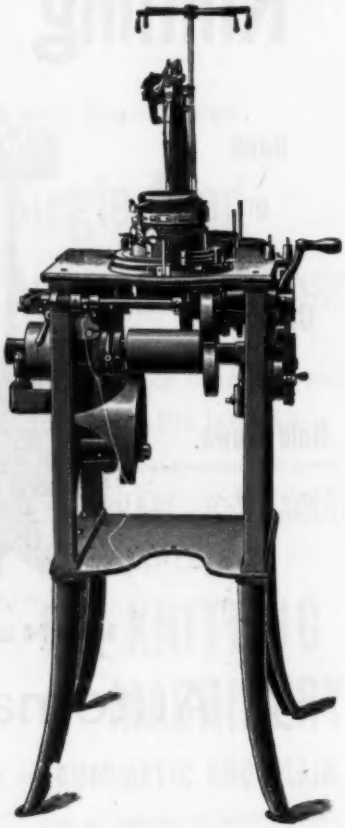
Automatic Knitter,

FOR SEAMLESS HOSIERY.

All Kinds and Gauges.



Best method of transferring ribbed legs and tops.

Greatest production of perfect work at least expense.

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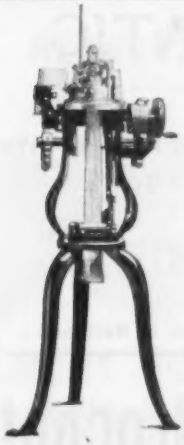

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Automatic Welt and Loose Course Machine for Sock Tops. New Circular Stripes with Welt, Loose Course and Striping (Automatic), for Shirt Cuffs, Sock Tops, Hose Legs, Wristers, etc.

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All kinds of

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For Men's Underwear, Ladies' and Misses' Hose Legs & Leggings

CORRESPONDENCE SOLICITED.

LATCH NEEDLES

FOR ALL STYLES OF

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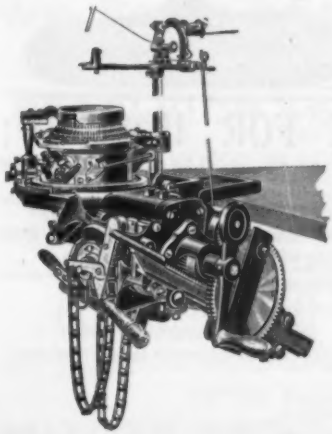
Our "SUPERIOR," or sunken rivet head Needles will save you money every day in the year.

TRY THEM.

DODGE NEEDLE COMPANY, Manchester, N. H.

Excelsior Knitting Machine Manufacturing Co.



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7-8 AUTOMATIC KNITTERS,

Adapted for Ladies' Plain Hose, Men's Half Hose or footing Ribbed Hose.

Its Production is Greater than any 7-8 or full Automatic Machine now on the market.

½ AND ¾ AUTOMATIC
ATTACHMENTS

To Seamless Knitters, make Old Machines into New Ones, and the Best of their respective classes.

Paxton & O'Neill,

127 Bread Street, Philadelphia,

Makers of Wrought Steel Cylinders and Dials for all kinds of Machines.

THE
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For finishing the edges of Knit Goods, Bed Blankets, Horse Blankets, or other fabrics.

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HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

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PERFECT FAST BLACK FOR HOSIERY;
Process For Sale

Has been adopted by many leading Hosiery Manufacturers.

The new Dubois "Sanitary" Fast Black Process satisfies every requirement. It is perfectly fast, costs only 1½ to 2½c. per lb. to produce. Dyes in one dip right from the Knitting Machine, any finish, lisle thread or silk. It is non-poisonous, of uniform color, will not crock, green or tender the goods.

The manufacturer can safely guarantee this black. It is second to none in the world.

The formula is for sale, and competent chemist will go to give personal instruction and start the work.

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BEATTIES' Patent Loopers.

Wm. Beattie & Son,
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An Illustrated Catalogue will be sent on application.

CIRCULAR AUTOMATIC RIB KNITTING MACHINERY FOR

Combination Suits,
Sweaters,
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Over 1000 machines now in operation.
Just now we are making a speciality of 14 and 16 feed machines for stripes.

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CARDIGAN JACKET and CIRCULAR KNITTING MACHINES
For Shirts and Hosiery.

Cylinders and Dials
Of all kinds made and hardened.

GERMANTOWN SKEIN WINDER and LINKS FOR DOUBLE RIBS.
Special Machine and Jobbing Work Promptly Attended to.

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Spring Needle Circular Knitting Machine
For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.
A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets

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Fabric trimmers put on all makes of machines.
All makes of machines Repaired, Altered and Rebuilt.
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CIRCULAR RIB KNITTING MACHINES,

Carefully designed and well made with Solid Forged Steel Cylinders and Dials, Segmental Cam Rings, Encased Take-up, Stop Motions, etc. Standard Sizes, Reasonable Prices. Also

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Flat Rib Knitting Machines, 2 to 5 sections, Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Collarette Attachments, etc., etc. All the latest improvements. Sinkers and all Rib Machinery supplies. Patent Springs for Dyeing Boards. Also Ribbed Anklets made to order. Branch Shop, AMSTERDAM, N.Y.

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Carefully constructed, substantially built.

Filtering Oilers, Parts Removable Without Disturbing Frame,

Delicate Adjustment, High Speed with Durability.

A New Transfer for Knitting Machines.

Start the New Year right, and save expense of repairs and seconds. Correspondence solicited.

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Direct selling Agent for Hosiery, Knit Goods and Underwear.

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Four and Five Section Flat Cuff Machines.

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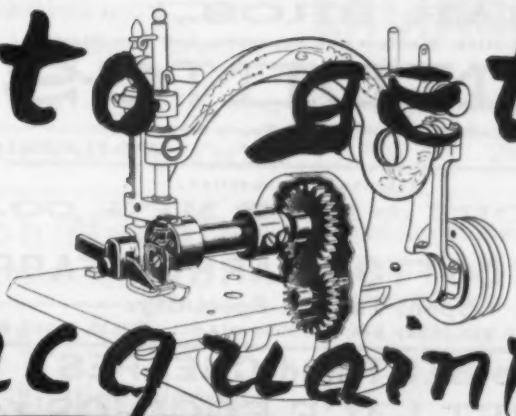
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Everything Used In the Manufacture and Trimming of Knit Underwear.

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GAS ENGINES for city or country.	EFFICIENT
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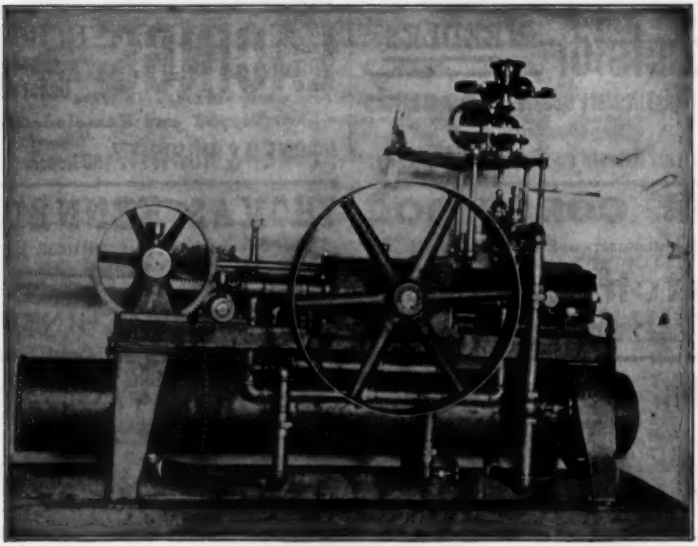

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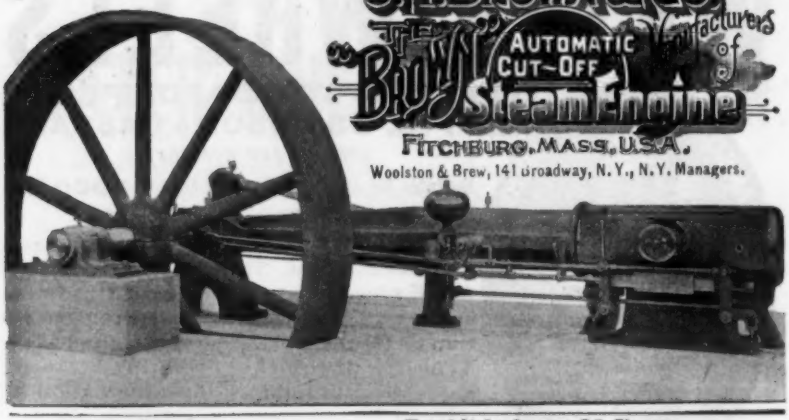
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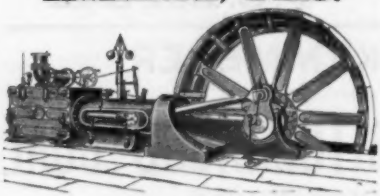

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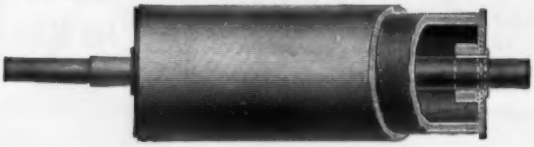

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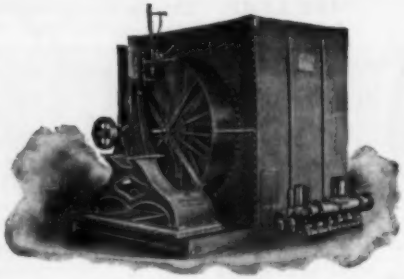

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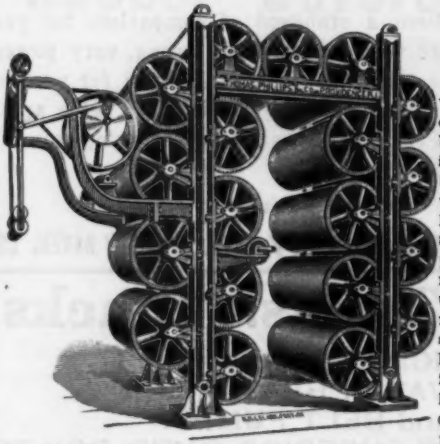

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